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Our Thirty-Third Anniversary

IN the light of present conditions in Malaya, the Dutch Indies, South America and Africa, where once flourishing crude rubber interests are facing bankruptcy; considering the fact that the Russian, German and Austrian rubber trade is either annihilated or nearly so; visualizing the great burdens under which English, French, Italian and Spanish rubber manufacturers are staggering; recalling our own once flourishing guayule industry, now almost obliterated; remembering the situation which the great reclaiming industry is courageously enduring; and not forgetting our own present low price-level of manufactured rubber goods, we hesitate to light the thirty-three candles.

Not in any pessimistic mood are we, for the future is full of promise of better things, but because matters of much greater moment engross us with their insistence.

We therefore, with reluctance, lay aside the splendid appreciations cabled, telegraphed, written and spoken that marked this our thirty-third birthday. For the confidence and appreciation we thank our friends here and abroad. The pages of space that an adequate presentation of these communications would require we devote to definite attempts to improve the existing situation. We have thought or interest in little else.

Great Progress in Safety Work

A LIFE snuffed out every six minutes or 76,000 deaths from accident in 1920 is what was reported at the recent congress of the National Safety Council. Nor does this take into account the thousands maimed and invalided, together with those in whom the seeds of disease or breakdown are sown. That the rubber industry has a keen interest in these figures goes without saying. It has long been classed as "extra hazardous" and the wiser and kindlier, not to forget the shrewder heads of the big companies, are studying their problems with infinite care. Unlike much in this most secretive of secret industries none of the work done or results attained in rubber safety work are kept under cover. Everything is brought into the full light of day that not only our own industry but the paper, lumber, textile and others may profit by our experience. So, too, may the small employer adapt the work of the employer of thousands to his own problems.

These results are brought out in the essays read at the regular meetings of the Rubber Section of the National Safety Council. As they are written by distinguished specialists whose whole time is given to making rubber factories safer, and workers healthier, and as they have the financial and moral support of the leaders in the trade they are well worth careful study. Every employer, every superintendent and foreman should make this knowledge his own, for the majority of the rubber factory accidents are due to ignorance along these lines.

Harnessing Supply and Demand

THE most important subject in sight is the price of rubber, present and future, particularly future. That attempts to control production and put the price, say in the neighborhood of thirty cents, will be made, is an open secret. Charles R. Flint back in the nineties said such control was "an economic impossibility"; Herbert Hoover in a letter to the Editor of THE INDIA RUBBER WORLD, written not long ago and speaking of a broad working agreement between associations of producers and consumers, working under sanction of their governments, said the idea was "not economically unsound."

Thus the "Father of Trusts" and the "Father of the Starving Millions of Europe" would seem to disagree, although it is perfectly possible that present day con-

ditions differ from those of the days of trust creation. Naturally the law of supply and demand will continue to function. If, however, the pair are harnessed and driven as a span, instead of the old time tug-of-war, they may pull the industry out of its hole.

In the light of history, corners must fail, voluntary restriction does not restrict, valorization is one sided. Yet the world cannot afford to wait until another great war impends to consider ample production and fair distribution at reasonable rates of so basic a commodity as crude rubber. In times of peace prepare for war, applies with as much force to economic as to military conditions; and in any scheme of industrial preparedness rubber must bulk large. The late war proved this, as it demonstrated the importance of international control of this as well as other key industries.

The time is ripe for effecting control and apportionment of rubber in which all nations might freely share the benefits according to manifest industrial needs, but which benefits would be at once forfeited by any leagued nation violating the trade compact. Cooperation between planters, manufacturers, financiers, and governments, embodying the sound features of all former attempts, should spell success. A tight rein for production, a loose rein and the spur for consumption, is all that is necessary.

The Ever Wasteful Strike

The distinguished men forming the Committee on Elimination of Waste in Industry, of the American Engineering Council, report that over a half billion of dollars in wages is lost annually in the building industry alone through unemployment. Add to this the direct losses through textile, coal, railroad and scores of lesser strikes, and the total is appalling. In all of this the rubber business bears its share,—no small amount.

"The major causes of strikes are occasioned by demands for increase in wages, recognition of the union, decrease in working hours, and by jurisdictional disputes. If the Massachusetts rate of 138,519 working days lost in 1920 through strikes is applied to the entire country a waste of some 3,000,000 days per year is found."

These figures were compiled before the great coal strike which involved a loss of 6,000,000 days a week, nor does it cover the loss in days' work of the railroad strike that has so handicapped industry this summer and autumn.

If the greatest cause of strikes, the demand for increased wages, could be eliminated, strikes as a factor of waste would shrink into insignificance. The remedy suggested is cooperation between employers and employes. This should embrace a wage commensurate with amount of production, with additional compensation for additional output. It would furnish an incentive to work and give recognition to the deserving. Unions should cooperate to the extent of eliminating the flat rate for all of a trade, and by modifying the restrictions that forbid the acceptance of piece work.

Moreover there should come a revival of the old guild spirit which tends to give a man pride in the quantity and quality of his work. Thus would be brought about an increase of production, the maintenance of high wages with a resultant lowering of costs.

Rubber Soles and Spiked Soles

A new attack upon rubber soles has been launched, this time through the golf clubs. It takes the form of a strong line of praise of the spiked shoe which is not only said to be safer but the spikes penetrating the turf aerate the soil and thus promote root health. On the other hand the rubber sole is said to mat the grass and cause it to wither. As proof of this the following is given: "Place a spiked shoe and a rubber soled side by side on a lawn and leave them for a week. At the end of that time the grass will be found green under the first, withered under the second."

Possibly this is true. Very rarely, however, does the sole in golf playing remain as long as the test suggests. To be sure some foursomes are so slow that, to the impatient, hours seem to pass before they lift reluctant feet for forward progress, but to linger days or even a week,—not on any course that we wot of. Furthermore, how about the radio activity that the rubber sole brings to bear on the grass roots and which is absent in the spiked sole? Does not that one advantage show the superlative value of the rubber sole?

A live fumigation company with $55,000 invested in rubberized cloth tents, has entered upon a four months' task of fumigating the orange and lemon trees in one section alone of Southern California. With its tents and gassing apparatus the company last year treated 590,000 trees and effectively checked the ravages of citrocola and black scale. The cost for each tree this year will be 33¼ cents, it is estimated, as compared with 36¼ cents last year. The process for fumigating the trees with hydrocyanic gas was described at length in The India Rubber World of May, 1921. This method of pest extermination will some day be world wide in its application. It will be recalled that thirty years ago the greatest use for duck was found in hay caps for the farmer. So, too, if agriculture really adopts the rubber tent the consumption of crude will be vastly increased.

"A free American," declares President Harding, "has the right to labor without any other's leave." At the same time, "it would be no less an abridgment to deny men the right to bargain collectively. Governments cannot tolerate any class or grouped domination through force but must be for all the people ever aiming at the common good."

Can Rubber Be Controlled?

A Review of Plans—Past and Present

The Early British Attitude—A Successful Secret Pool—The First Vianna Corner—Later Failures—The Flint Corner—Brazilian Attempts to Valorize Rubber—Today's Plantation Problem—Voluntary Restriction—British Governmental Committees—The Stevenson-Duncan Plan—Proposed International Pool—Export License Plan—American Holding Trust Plan—The Braddon, Kelly-Smith, Carey, and Physick Schemes—Government and Association Control—To Increase Use of Rubber—Commodities Other Than Rubber, and Control—Copper—Cotton—Tea—Valorizing Fish—Metal Price Fixing—Australian Grants—Coffee Valorization

The Early British Attitude

WHEN the crude rubber market years ago was in a runaway state, fluctuations violent, and the making of forward contracts for large quantities a very hazardous undertaking, many efforts were made to get British rubber manufacturers to combine and set a maximum price on purchases. But the manufacturers have never taken kindly to such a proposition, much as they might wish to have a limit put on the price charged them. They have always liked the idea of being free to take advantage of market changes, to buy plentifully when stocks are cheap, as well as to sell freely, if overstocked, when prices are high. Opponents of the manufacturers' combination scheme figured out that such a plan, if put into effect, would work out like this:

When rubber would be under the maximum price a manufacturer would have to buy far in advance to insure having sufficient stock to cover his contracts; but if the combination were to set a price of say 50 cents a pound and the open market price rose to 55 cents, he would have to pay the current quotation or run short of stock to carry out his contracts, even though contrary to the combination agreement to which he subscribed. Nor did manufacturers relish the idea that such a combination, by arraying them against planters, merchants, and brokers, would bring on a trade war, the duration of which would be measured only by the funds and reserves of either side.

Another objection made was that after paying the maximum price, planting might be so stimulated that an unexpected quantity of rubber might be put on the market and the price break sharply. Had he put by a year's supply he would have to write down his inventory and pocket a loss. The terms of the combination compact might even require him to share with a less fortunate member at the maximum price when he might take advantage of a market rise and secure a profit. Unless such a combination were international, it was argued, it could scarcely hope to restrain the rubber sellers within reasonable limits, and even then an unusual trade disturbance in any one nation might easily upset all calculations.

A Successful Secret Pool

But while manufacturers abroad were reluctant to enter a combination to regulate the price of the rubber they had to buy, American manufacturers saw an advantage in such a plan, and for five years contrived cleverly to keep rubber prices within what they deemed reasonable bounds. In 1880 several of the larger rubber goods makers organized the New York Trading Co. to buy and sell crude rubber. It had a capital of $100,000, yet in five years paid $1,000,000 in dividends. During all that time no one outside the group controlling this close corporation scarcely knew of its existence. Each of the member firms bought and sold rubber ostensibly on its own account, but really for the account of the secret company; and in that way held a remarkable control over market prices. These operations were carried on through the importing firm of William R. Grace & Co., New York, N. Y., of which Charles R. Flint, who later tried on an extensive scale to control the crude rubber market on his own account, was a member.

That "combination in restraint of trade" was perhaps the nearest approach to a monopoly that has ever been experienced in the rubber trade, and it certainly exercised a longer control over rubber values than any individual or corporation has ever been able to effect. Its existence would scarcely be possible in these days of repressive legislation, and even though such rubber purchasers were bona fide buyers and not speculators.

The Vianna Rubber Corner

The earliest attempt on any considerable scale to corner the crude rubber market was that made by a Portuguese, João C. G. Vianna, otherwise known as Baron de Gondoriz, who had gone to Brazil at an early age and made an intimate study of the rubber situation. In 1878, when the finer qualities of Pará rubber were selling at from 40 to 50 cents a pound, he persuaded a group of Brazilian bankers that much money could be made by getting control of Brazilian rubber, and with their aid he bought in home and foreign markets until he forced the price average to approximately $1 a pound. It is understood that the syndicate made a big profit on the deal.

Later Failures

Encouraged with his success in 1878, the baron sought in 1881 to again manipulate the rubber market but quit abruptly. He tried another corner in rubber in 1882, this time enlisting the aid of not only Brazilian but European speculators. They manipulated rubber prices from 40 cents until they reached a maximum of $1.25, at which figure the syndicate is said to have had in its control $5,000,000 worth of rubber. British and other manufacturers paid unwilling tribute to the syndicate, but American manufacturers banded together in October, 1882, and served an ultimatum on the pool managers that if rubber prices were not allowed to come back to normal they would shut down their factories indefinitely. That resolution, it is said, sounded the death knell of Vianna's second attempt to corner the entire Amazon output of rubber, and the baron and his cospeculators capitulated with heavy losses.

The Americans were aided in their fight against the speculators by a fortunate circumstance. Anticipating a progressive increase in sales which did not materialize, they produced earlier in the year about 40 per cent more goods than usual. Later this overproduction proved to be a blessing in disguise. When they shut down they had therefore considerable reserve stock to draw upon.

Even the painful lesson of 1882 did not deter Vianna from making a third effort to corner rubber. In 1891 he succeeded in consolidating all the rubber interests in Pará for the expected "big killing" and with that backing succeeded in interesting a number of London bankers in his scheme. The syndicate utilized a capital of $25,000,000 and is said to have got control of 90 per cent of the available supply of Brazilian and other rubber during the nine months in which it actively operated. Large as was the capital, it proved inadequate for buying up the new crop, the development of which had been greatly stimulated by the rising price. At the same time American manufacturers and importers again campaigned against the syndicate, the rubber goods makers by curtailing their requirements and in some cases closing down, and the importers by stubbornly refusing to make any more than absolutely necessary commitments.

Meanwhile the price average had been boosted to 87 cents a

pound, and the British bankers who were carrying certificates for rubber in warehouses, finding sales increasingly difficult at the top prices and Americans intrenching themselves for a long fight, began to get nervous and insisted upon the Vianna syndicate putting up larger margins on the certificates. The speculators were at the end of their tether, and their dream of making millions had faded away when the forced sale of a 100-ton lot of rubber started a stampede. In the panic that followed the price average broke to 64 cents. A moderate upward reaction followed but before long prices sagged again and the market figures were made by supply and demand instead of by Vianna.

In a way, many came to regard Vianna as a public benefactor. It was remarked at the time of his last corner that his persistent efforts to keep up the price of fine Pará had greatly stimulated the use of coarser rubbers and had aroused renewed interest in gathering and curing those gums. He had perhaps done the industry more good than harm.

The Flint Corner

The final attempt to corner crude rubber came in 1900 when Charles R. Flint formed a $50,000,000 company known as the International Crude Rubber Co. The whole story has never been told but rumor and fragmentary newspaper paragraphs threw much light upon it. Thomas W. Lawson was quoted as affirming that the Standard Oil Co. at the beginning either backed or agreed to back Mr. Flint, but for some reason they withdrew. At all events the project failed and Flint is quoted as saying: "Any attempt to artificially fix prices is economic suicide."

A great variety of plans, some successful, others not, have been evolved by governments to aid planters and producers to maintain prices and to control production.

Brazil's First Valorization Scheme

Brazil made its first effort to valorize rubber in 1906. Briefly, the government's plan was: (1) To pay the official daily market price on all crude rubber "not required for Brazilian factories" and which rubber had been deposited at government depots and put in government-provided boxes; (2) the rubber producing states were conceded the right of exportation, but the government could sell its purchased rubber to merchants through the states' fiscal delegations or with the aid of banks at a profit-yielding price; (3) the government was to float a home or foreign loan of £10,000,000 at 5 per cent to finance the valorization scheme which would include a purchasing fund and would provide for loans being made to producers to enable them to hold their products for higher prices. The profits from the sale of rubber through governmental agency were to pay the interest and provide for a sinking fund.

Although authentic information is lacking as to how the scheme worked out in detail, it is known that the result was very unsatisfactory, failing to sustain prices or to stimulate the industry.

Brazil's Second Valorization Scheme

Various attempts were afterward made by the State of Pará, Acre Territory, and other Brazilian rubber-producing divisions to relieve the rubber gatherers and to raise more revenue from the sale of rubber abroad. The taxes were lowered on production by the local governments and the export schedule of duties was revised downward by the general government. Gatherers were also urged to improve the quality of their product in order that it might readily command a better price. These measures at best afforded only temporary advantage. Yielding to the continued urging of the rubber gatherers for relief and to speculators who plausibly represented that while they might gain some benefits the rubber gatherers and the government would gain even greater advantage, the Brazilian administration late in 1908 launched another valorization scheme.

It authorized the formation of a privileged syndicate headed by the Bank of Brazil, which was to act as a middleman and presumably stabilize prices for both producer and consumer, and especially to safeguard the native industry from speculation from without. If production were excessive the syndicate was empowered to discourage it by restricting exports until the world market prices rose again to a more profitable range. This range was indicated in the price of 3*s.* a pound at which the syndicate hoped to sell upriver fine. A sliding scale of export duties was part of the plan, such duties to range from 22 per cent on rubber selling at 2*s.* 11¾*d.* down to 18 per cent on rubber selling at 3*s.* 5½*d.*

Advocates of the scheme sought to justify the preferential export levies as quite as just and as legal as the reduction in import duties allowed to agriculturists. It was a poor rule, they claimed, that would not work both ways. Many realized that it would be perhaps the last chance Brazil would ever have to get its maximum price for rubber, for in the offing were looming the new plantations with their lighter taxes and lower production costs, but the rubber from which had not yet come into the market in large quantities.

Opponents of the scheme declared at the outset that any such effort to maintain an arbitrary market value was foredoomed to failure, even disregarding the prospects of cheaper rubber from the new fields in the Orient. There was no reason, they said, why campaigns could not be waged easily and effectively against it, and they deemed it unwise for Brazil to attempt again such control of rubber prices, reminding the government, too, of its unfortunate effort to valorize coffee a few years before. A purchasing schedule for rubber, they held, should be elastic, whereas that of the new valorization would benefit while the open market prices ruled above the "pegged" prices, but when world prices fell the syndicate either would not feel obligated or could not pay higher prices to Brazilians. Hence the permanent advantage to the latter was not evident.

The most likely result of such a price-bolstering scheme, as the opponents viewed it, was the drawing out of American, British, French and German exporting concerns and surrender of the Brazilian market to the Pará syndicate, which could manipulate prices at will. Brazilians were warned that in the event of their putting the scheme into effect retaliative measures would be instituted, one of which would be curtailment in the use of Pará rubber by manufacturers everywhere; and a countervailing duty on coffee was suggested to offset rubber valorization.

Nevertheless the government went ahead with its plan and the syndicate, acting as fiscal agent, bought practically all the rubber offered, at prices fairly advantageous for the time to the sellers, and held out the bulk of the rubber for maximum prices. Buyers took no more Pará rubber than they could help, and supplies of wild rubber from other places and of grown rubber increased. The Brazilian government finally realized that it had attempted too much, and, faced with the prospect of certain loss, it arranged with the syndicate to unload its stocks, even at a considerable sacrifice. The official Bank of Brazil is said to have lost $10,000,000 through the scheme, the government is said to have gone close to bankruptcy, and the rubber gatherers at the close of 1909 found their last condition worse than their first.

Brazil's Third Valorization Scheme

Undismayed by the failure of its previous attempts to maintain rubber prices artificially, and heedless of the fact that while the Amazon production had dropped from 42,000 tons in 1909 to about 30,000 tons in 1915, while the plantation output had in the same period risen from 3,600 to 85,000 tons, Brazil in 1915 again essayed valorization. The scheme differed from the preceding one in at least one important particular. The government and its fiscal agent, the Bank of Brazil, having realized the futility of purchasing practically all the rubber offered, was now willing to carry rubber on a margin and to do its best to sustain the price. Assurance was given that no large amount of rubber would be withheld from the market.

Under the new plan the owner of rubber, if in need of money, could put the rubber in a government warehouse and get 80 per cent of the ruling market price advanced to him so that he might be able to hold out, for a while at least, until the market improved. The bank would at all times require the owner to keep up a margin of 20 per cent to safeguard it against sagging prices. The Chamber of Deputies approved an issue of 350,000 contos ($90,000,000) paper to provide for payment of various debts and also for a fund for the valorization of rubber and coffee. The Senate demurred, and the project failed.

The Present Plantation Problem

The slump in the rubber-growing industry reached an acute stage about the middle of 1921, when it shared in the world-wide business depression. In Malaya alone twenty organized companies and numerous individual growers had failed in the course of a year as demand dropped and prices sagged to new low levels, a great amount in loans was called in, and many producing estates were either left by their owners to revert to nature or were literally sold for a song. A year before, the Federated Malay States had a surplus of $100,000,000, but this dwindled to meet urgent public needs. With a world stock of 300,000 tons of crude rubber, an estimated 1921 production of 360,000 tons from plantations soon capable of yielding 500,000 tons, with 30,000 tons of wild rubber soon coming to market, but with the potential consumption for 1922 not likely to exceed 250,000 tons, the outlook was decidedly blue for the owners of the 2,200,000 planted acres, one-half of which (1,146,000 acres controlled by members of the Rubber Growers' Association) are under British control. The Joint Malayan Government's Commission gives the total of all rubber plantation acreage as 3,300,000.

Plans to Relieve Growers

Numerous plans were proposed to meet the crisis, or at least relieve the distressed planters who found that prices in many cases fell much below production costs. One was to have the government impose an export duty on all rubber exported exceeding 50 per cent of the normal output, the object of the tax being to discourage overproduction. Another was to create an international rubber assurance association to be controlled by a board representing the rubber growers in various parts of the world, which would restrict output, fix prices, and limit sales to or through affiliated dealers. Neither has yet matured.

Another which for a while met with much favor was that proposed at a session of the Rubber Growers' Association, London, which was intended to reduce production one-half, regulate sales as to prices, time, and quantities, and to assist producers with loans on rubber gathered or to be gathered or upon estates. It involved the formation of a supercorporation having a nominal capital of £2,000,000 which would raise £3,000,000 on debenture notes at once, and have power to borrow £5,000,000 more. The ordinary shares were to be allotted to planters in the proportion of one share for each planted acre owned. An essential part of the financing was that on all rubber sold under the control of the corporation the latter was to collect a fee (estimated as ample at a penny a pound) to pay the cost of management, debenture interest and amortization, and to provide a fund to insure the fulfilment by the members of their obligations to the corporation.

Opponents of the various relief plans contended that the benefits derived would be only temporary, and that the law of supply and demand would in time defeat all trade control schemes; that those who could not be brought into such a combination (Asiatics and others owning about one-fourth of the planted acreage) would, without extra effort, gain by price-raising plans and would always be a disturbing trade influence; and that most of the plans were too unwieldy, inelastic, and complicated to be efficient.

Voluntary Restriction Given Trial

When, in the autumn of 1920, the British Rubber Growers' Association announced that it had succeeded in prevailing upon the owners of fully 70 per cent of the producing area in Malaya and Ceylon to agree for the period extending from November 1, 1920, to Januay 1, 1922, to a 25 per cent curtailment of the production of rubber, and the statement was made that many Japanese and other planters would cooperate, many believed that a long stride had been taken in the direction of the goal of cooperation which would solve the major difficulties of the planters. The policy of restriction was adhered to quite consistently by the planters and the largely reduced outturn of rubber undoubtedly relieved the market congestion and kept prices from sinking lower.

The Rubber Growers' Association tried hard to have the fourteen months' experiment in voluntary restriction continued for the first six months of 1922, but instead of getting assents from owners controlling the required 70 per cent of producing acreage to make the scheme operative, it got assents totaling but 55 per cent; and the restriction plan that promised so much was reluctantly abandoned. The chief trouble lay in getting planters in Ceylon and the Dutch Indies to again limit their freedom. It is claimed in their behalf that they had less need than their Malayan rivals of entering any such price or commodity control scheme, as their production costs averaged much less.

British Government Considers Plans

At the urgent solicitation of rubber planters in British Colonies and Dependencies, the Secretary of State for the Colonies appointed a committee late in 1921 to canvass the rubber growing situation and to propose, if possible, some measures of relief. The committee comprised Sir James Stevenson, Bart., G.C.M.G., chairman, Sir Stanley Bois, Sir Edward Brockman, K.C.M.G., E. J. Byrne, William Duncan, Sir Gilbert Grindle, K.C.M.G., C.B., H. Eric Miller, and Sir Edward Rosling, with S. H. Leake, O.B.E., secretary. After an exhaustive study, the committee submitted its report in June, 1922. It declared it viewed with grave concern the position of the planting industry unless steps were taken to reduce stocks and to prevent overproduction. Its opinion was that consumption would not overtake potential production for some years. The recommendation was made that a restriction be made at once to 75 per cent of normal production to reduce the latter to the level of probable 1922 consumption.

Of the many plans proposed to the committee but two were finally considered as practicable solutions of the planters' problem. One was that suggested by the Duncan Committee in January, 1921, and the other the Stevenson plan, offered by the chairman. The Duncan plan would require legislation prohibiting production and export of any rubber in excess of a defined percentage of that produced or exported within a specified period. Standard production, from which such reckoning would be made, would be considered the total 330,000 tons of plantation rubber for the year ended October 31, 1920. A margin of production was to be left available to meet forward contracts or cases of special hardship.

The Stevenson-Duncan Plan

In the Stevenson plan, "standard production" would be the same as in the Duncan plan, and the following export duties would be levied to check overproduction:

Over 100%	1s. 2d.	71% to 75%	6d.
91% to 100%	1s. 0d.	66% to 70%	4d.
81% to 90%	10d.	61% to 65%	2d.
76% to 80%	8d.	60% and under	1d.

Regardless of price of rubber or quantity exported, a duty of one penny a pound would be levied on all shipments for about three years instead of the present ad valorem duty. When trade conditions improved to warrant a larger percentage of rubber being exported, sufficient elasticity could be imparted to the schedule by setting the minimum rate of 1*d.* just below the increased percentage required. Hence, if the market could absorb 70 instead of 60 per cent, the duty on 70 per cent and under, would be fixed at 1*d.*, leaving unchanged the duty on 71 per cent and over. It is claimed that special advantages of the plan are that it provides revenue for the State, and is easy to administer.

The special committee favored the Stevenson plan as preferable. For twelve months the percentage of standard production allowed would be set at 60 per cent, which, with the margin to meet forward contracts or cases of special hardships, would, it is computed, effect a substantial reduction in the surplus stock of crude rubber. Alterations in the percentage of standard production would be governed by the price of standard smoked sheet in the London market. Should the price rule above 1*s.* 3*d.* a pound London landed terms during three consecutive months, production percentage of 65 would be allowed for the following three months, with a similar adjustment, upward or downward, every quarter of a year following. In no case, however, would production percentage fall below 60. It is claimed that the plan not only insures a fair profit to growers but a reasonable and stabilized price that most manufacturers seek and which would encourage industrial expansion.

The special committee would have a substantial part of the export duty applied by the government for the direct benefit of the rubber industry as in scientific research and in developing new uses for rubber. Confident that no effective action can be had without the cooperation of Malaya, Ceylon, and the Netherlands East Indies, and that some such outturn and price regulation would benefit Dutch as well as British growers, the committee urged the Secretary of State for the Colonies to use his good offices to bring about an international conference soon in London, at which the Dutch Government might be represented and see its way clear toward entering into a trade upbuilding combination that could not fail to be mutually advantageous.

A great number of plans and proposals from planters and financiers have been put forward working toward the same end. A few of the most interesting are cited below.

An International Pool

A recent report from Amsterdam tells of an effort to form a pool of rubber growers and merchants to control 100,000 tons of rubber with a view toward enhancing the price of the commodity. The administration of the pool would be controlled by the British Rubber Growers' Association, the "Rubber Trust Associations" of London and New York, and the International Rubber Cultivators at the Hague. The pool is still in the embryonic stage. It is known, however, that Dutch rubber-growing interests are strongly urging upon their government to help restrict production in order to make the raising and marketing of rubber profitable.

General Export Licenses

Inasmuch as voluntary restriction of the rubber outturn has been tried and failed, a system of export licenses is proposed in its place. This would imply compulsory restriction and close supervision and coordination by all governments concerned, as well as financial assistance. Governments, it is urged, should also insist, and they would have to if they intervened, upon statistical bureaus being maintained in each of the rubber-growing countries, there being no official gathering of rubber statistics in either the Straits Settlements, the Malaya States, Sumatra, Java, or Ceylon.

The Helferrich Plan

This is one of the most recent plans and proposes to establish control syndicates in the Federated Malay States, the Netherlands East Indies and Ceylon. Each syndicate would control the estates in its own area, particularly for restriction. It also would see to it that the estates which were stopped from producing participated in profits. This plan is in effect an adaptation of the Java sugar control scheme applied to rubber.

Like Java Sugar Control

Among the many propositions made for helping the rubber planters is that estates control syndicates be established in Malaya, Ceylon and the Dutch East Indies similar to the sugar production control which functions very efficiently in Java. This organization assures profits to the shutdown estates as well as the active ones; and it is contended that were a similar plan worked out for the rubber growers there would be little difficulty in inducing them to enter a combination that would effectually check overproduction and enhance the price of a commodity of which the world has an unwieldly surplus.

An American Holding Trust

An American holding trust, with a London advisory board, which would acquire and hold plantation properties and shares, bought at minimum prices, and which would share in regulating the output of crude rubber and controlling the price thereon, has also been suggested as a means for relieving the plight of the planters and reviving and stabilizing the rubber industry in general. It is held that under such an arrangement an ample supply of rubber could be assured at a price that should never exceed 45 cents a pound, even if an unusual demand were to spring up. The plan would contemplate a customs duty on rubber exports and a small levy for propaganda with a minimum of Government interference, as many rubber growers prefer to term official attempts to regulate private business, especially through compulsion.

Rubber Parliament Idea

Noting the conspicuous success of the arms limitation conference at Washington and mindful of the general modern trend toward closer organization in many important industrial lines, D. F. L. Zorn, chairman of the Rubber Shareholders' Association, recently advocated before the British Institution of the Rubber Industry in London, as a solution of the planters' troubles, the establishment of a rubber parliament, or a consulative central council. Such a body, he contended, might be so broad as to ultimately embrace rubber planters, manufacturers, shareholders, merchants, brokers, distributers, and even consumers, although it might not be possible to start with many unlike groups.

As a result of the free interchange of ideas in such a council, the author of the plan says those engaged in every department of the rubber industry would soon perceive that they have a community of interest, greater and closer than they have ever realized. The ultimate outcome, he says, would be the rejection of the old competitive system and the development and distribution with such advantages as: combined buying power, standardization of product, specialization in manufacture, better handling of by-products, transport economics, central selling and advertising department, scientific and technical research, and collection and dissemination of statistical information.

The Braddon Scheme

One of the much discussed plans evolved in Malaya last year for the relief of the planters was the Braddon scheme. Features of it were: (1) the regulation of supplies; (2) the creation of an international rubber assurance association; (3) the election of a board to control the association by the rubber-growing industry in various countries; (4) the association to operate openly as a combine; (5) requiring the active membership of owners controlling 70 per cent of the planted area; (6) admission to non-proprietary membership of bona fide dealers in rubber; (7) confining membership to producers or sellers of at least ten tons annually; (8) that members should agree to restrict output wholly or partially as the association might decide, to refrain from selling below a minimum price to be fixed, or to or through outsiders and requiring dealer members to deal only with association members.

Kelly-Smith Scheme

To restrict output by 50 per cent was the chief feature of the Kelly-Smith scheme. This was to be effected by imposing a heavy export duty on all excess over 50 per cent of the normal output, such duty not to exceed 10 per cent ad valorem or 5 cents

a pound. The government would be urged to allow the free export of a designated proportion of the restricted output and impose taxes on any excess of that amount. It was suggested that if 100,000 tons be allowed for free export, while the remainder of the annual output then of 60,000 tons be taxed at even 5 per cent with rubber at 30 cents a pound, the government would get a revenue of $2,016,000 whereas it had been netting next to nothing from rubber exports; and the direct tax burden of the planters would be correspondingly lightened.

Carey and Physick Schemes

The Carey scheme of the planters was to impose a tax on all rubber produced, and the money thus obtained was to be considered as a loan from contributers that would bear suitable interest and be loaned out again to producers at a higher rate. The scheme could, it was claimed, be worked out with or without compulsory restriction.

The Physick scheme proposed compulsory restriction to 50 per cent of normal production, and the raising of a fund for the financing of planters' requirements, the industry and the government each contributing one half. The management of the fund was to be intrusted to a local body having powers conferred on it by the government.

Government and Association Control

That governments and trade associations can satisfactorily control the price, production and distribution of staple commodities was strikingly demonstrated during the World War, particularly with respect to rubber. The United States was using about 60,000 tons of crude rubber yearly when the war broke out and Great Britain, controlling 71,000 out of the 120,000 tons available, declared rubber to be contraband. All non-British rubber was fast rising in price and American manufacturers appealed to their government for relief. The government being then neutral could not bargain with Great Britain, but it unofficially sanctioned an arrangement made by The Rubber Association of America whereby the latter got the rubber it needed at a fair price by agreeing to export only through London so as to keep the material out of enemy hands. Both sides kept faith, and the Rubber Association allocated the rubber to American manufacturers in a manner that won much praise for fairness and efficiency.

The American rubber industry experienced direct government control in 1917 when the United States entered the war and put an embargo on rubber. The factories' ration of raw rubber under the British trade agreement was cut to 7/16 of the 1916 purchases, and in 1918 the ration was cut to but 3/8 of the 1916 figures. Besides this the government imposed severe restrictions on the production of so-called non-essentials. In the light of such experience many rubber manufacturers believe that a way could be found whereby through cooperation the government might as easily help their industry in peace times as it handicapped it in war times.

To Increase Use of Rubber

That the salvation of the rubber-raising industry lies in developing a wider demand for rubber by finding either a new and remarkably special use for the staple, as developed so suddenly in the case of the automobile pneumatic tire, or a great variety of novel uses on a moderate scale, is a general conviction. Many have been the efforts made to stimulate invention and research along this line, the most conspicuous being that made last year by the Rubber Growers' Association, Inc., of Great Britain, which awarded over $25,000 in prizes for good suggestions. The latter ranged from that of sponge rubber mattresses and cushions, which won the capital prize of $5,000, to such ideas as rubberized paint, motorcar mudguards, rubberized Portland cement, hot-water boiler covering, sea buoys, packing box linings, soft rubber buttons, washstand tops, pneumatic soles, carpet lining, bellows, etc.

That an increasing demand for fine rubber goods vulcanized with the two-gas cold-curing Peachey process will develop is the opinion of many who have studied the results and possibilities of the new process, especially with regard to fine effects and rubber and leather combinations.

Increased use of rubber may come through the making of a "glass" of perfectly transparent rubber, such as that recently produced by Fordyce Jones, of England. It has 101 different uses if it can be produced on a commercial scale. Even for a new Ditmar rubber-celluloid composition there appears to be a big field in general photography and motion picture work.

The long-sustained supremacy of cork linoleum is being challenged by rubber "linoleum," which for many purposes is superior to the cork article.

Another possibility for the larger use of rubber lies in the employment of some such highly expanded form of rubber as "Onazote" as an insulating material for refrigerators, hot-water pipes and tanks, etc.

Much crude rubber may yet be required for the manufacture of an attractive, moisture-proof wallpaper that is meeting with much favor in Great Britain.

This recalls the work of Frederick Kaye, A.R.C.S., who has succeeded in producing many choice varieties of paper by mixing rubber latex with the pulp in varying quantities up to 20 per cent and thereby obtained a product with strength and folding endurance remarkably greater than that possessed by non-rubberized paper, not to mention its electric insulating and water-repelling advantages and the possibility of getting such paper toughened with even delicate tints unaffected.

Commodities Other Than Rubber, and Control

Corporations alone or in conjunction with others as trusts here and cartels abroad have for years been able to maintain the prices of liquors, oils, industrial alcohol, dyewoods, bananas, fish, drugs, chemicals, newsprint, and numerous other articles quite as effectively as if those materials had been valorized by the national government. Ordinarily the prices imposed have not been onerous, and, in fact, manufacturers have generally preferred the stabilized prices to the more uncertain prices of an absolutely free market. They always knew where they were in figuring on contracts. Advocates of joint action by rubber growers in maintaining prices are confident that some of the corporation methods referred to could be successfully employed in sustaining prices of the plantation product. They even feel that there is a way whereby the principle of collective bargaining to which the union laborites subscribe might be applied with success in marketing crude rubber.

Stabilizing Price of Copper

A problem not very much unlike that which has been troubling rubber growers confronted producers of copper in the United States in 1918. In the belief that the war would last longer, mine owners worked their holdings almost to the limit and piled up an immense stock of the red metal. With the Armistice came almost a cessation of government buying. Copper producers then hoped that reconstruction in Europe would in a large measure offset the sharp drop in war demands, but even in that expectation the copper men were doomed to disappointment, at least until quite recently. Nor was domestic demand for a long time near the normal point.

Quotations started to soften. Foreseeing an inevitable drop and possibly a sharp ruinous decline in the price of the metal that might be started at any time if some concern holding a lot of copper were forced to realize money quickly, a number of leaders in the industry conferred about various plans to forestall such an untoward event. The scheme finally evolved was one which, while not ostensibly designed to control the price of the metal, but rather to develop foreign trade, has had a very decided effect in stabilizing the price of copper at home and abroad. The organization by which this was effected was the Copper Export Association, comprised of seventeen big producing concerns, some

of them with mines in Mexico and Alaska as well as in the United States. Its incorporation was made in December, 1918, and it qualified under the Webb Act "to engage in copper export trade," and became the exclusive medium for export sales of copper by companies which together produced about 75 per cent of the national output of copper.

The allied companies and their proportionate holdings in the "pool" as some term it, are as follows:

Phelps Dodge	10.90	Braden	5.95
American Smelting & Refining	5.00	Chino	3.66
Ray Consolidated	4.00	Nevada Consolidated	4.45
Anaconda	12.26	United Verde	5.00
Inspiration	8.45	Green Cananea	4.16
Calumet & Hecla	6.00	New Cornelia	4.07
Utah	8.20	North Butte	1.75
Chile Exportation	7.58	Utah Consolidated	.34
Kennecott	5.06	Unallotted	2.70

The concern was financed thus: It was empowered to issue $40,000,000 of 8 per cent serial gold notes, of which but $27,000,000 have been put out. The notes are callable at par plus 1 per cent on any interest date after thirty days' notice, and they are guaranteed as to principal and interest by all the companies in the combination according to their relative holdings. The capital is composed of $250,000 7 per cent preferred stock of $100 par value, of which but $50,000 is outstanding, and of 500 common shares of no par value, of which but 32 have been issued.

With the funds in hand the association bought 400,000,000 pounds of copper from the constituent companies for sale abroad, and on all copper withdrawn there is paid to the trustee, The Guaranty Trust Co., New York, the sum of 12½ cents a pound, all money to be first applied on the payment of the notes and any surplus set aside for dividends. Many millions in notes have already been paid off and a good-sized sum set apart for dividend account. As a result of the association's powerful influence the price of copper has been kept from sagging below the fairly profitable price of 14 cents a pound, and the market for the metal has been greatly expanded.

Government Helps Cotton Growers

American cotton growers last year were helped by the United States Government with loans totaling many millions in marketing their crops in a steady, orderly, and profitable manner. The agency through which the aid was afforded was the War Finance Corporation.

It might be explained that when the 1921 cotton crop was planted there was still on hand a carryover of ten million 500-pound bales from 1920; and the cotton which on June 30, 1920, had been worth 37 cents a pound on the plantation, was nine months later sold with difficulty at 9½ cents a pound because of a great slump in the export trade and diminished domestic demand. The Southern States with their 28,000,000 population were hit hard when their chief product suffered such a setback.

In the year ended July 1, 1914, the United States had exported 9,500,000 bales of cotton, or two-thirds of the total exports of all cotton-producing countries. Europe took 93 per cent, Japan 4, and other countries 3 per cent. Not only were nearly all exports of American cotton up to that time financed by European capital, but the harvesting as well. American bankers drew on European banks and repaid largely through shipments of cotton. Many foreign manufacturers regularly contracted in this way for a whole year's supply, and gladly paid warehouse charges until they took the staple to their mills. They were able to do this because business conditions were reasonably stable and wild fluctuations in foreign exchange were quite unknown. But when a pound sterling, for instance, was worth $3.78, $3.20, $4.01, $3.34 and $3.38, all within a few months, buyers took no chances and contented themselves with just enough cotton to supply immediate needs.

The War Finance Corporation practically took the place of the great European banking interests when it went to the rescue of the distressed American cotton growers. In July, 1921, it made its first advance on 100,000 bales, soon afterward it loaned money on 200,000 bales, then on 300,000 bales, and so on until the tension was relaxed, the growers relieved and the crop well marketed. Private banking interests, heartened by the government's initiative, soon began to do their share towards restoring trade to more normal condition. Foreign and domestic buying was resumed with confidence, prices rose, and cotton congested in the hands of producers was once more distributed profitably and the greatly impaired purchasing power of the South steadily restored.

Newfoundland Fails in Valorizing Fish

The government of the British colony of Newfoundland a few years ago made an experiment in valorization that compares in a way with that of Brazil, but in this case the commodity was fish. Feeling the need of more revenue and doubtless anxious to benefit the large fishing population of the island, as well as confident that the island had a practical monopoly of the sale of cod and other fish, the government enacted a law forbidding the sale of any fish except at certain stipulated figures. At once the fishermen of Sweden and Norway saw their opportunity and fairly flooded the American and European markets with fish at prices below which Newfoundlanders were allowed to sell; and they made a big "clean up." Incidentally the Newfoundlanders found themselves "fish poor" with the result that the island suffered one of the worst panics in its history, and in the course of which large banks and staunch old business concerns went into bankruptcy and a large part of the population was virtually pauperized.

Governments Fix Metal Prices

Many governments fix the prices of metals, especially the precious metals, to stabilize currency systems and general trade. A familiar example of this is found in the United States where the price of gold is fixed by law at $20.67 an ounce. No miner may charge more for his product, but he is always sure of a market for it at the various mints. If his ore assays high and extraction cost is low he is sure of a good profit, but if not, then he may be very much out of luck, even though owning a gold mine. An attempt in 1896 to get the government to similarly valorize silver in a 16-to-1 ratio to relieve a situation due to surplus production, as it was claimed, of the white metal failed after it caused a memorable political upheaval. Since then there has been little agitation for price-fixing except to meet the temporary exigencies of the World War.

Grants, Subventions and Monopolies

Having lost the trade of the United Kingdom through inability to compete with Argentine rivals, Australian cattle raisefs have of late been in much distress and their government has yielded to pleas for relief. Since it could not fix prices on beef, it has decided to encourage the cattle-raising industry with a direct money grant, a subvention, which will amount to half a cent a pound on all dressed carcasses that go into international trade. This subsidy may reach a considerable sum and, of necessity, must be paid by the home taxpayer and not the foreign buyer of beef so that the actual result in such robbing of Peter to pay Paul may be not the enrichment of the commonwealth so much as the stirring up of industrial class jealousies.

Germany, despite the protests of the Reparations Commission, is granting subventions to potash producers, and encouraging workers in various other lines with either direct grants of money or corresponding benefits.

In the United States a powerful movement is on foot and frankly sponsored by the administration, for granting a subsidy, roughly figured at $30,000,000 a year, to shipping interests in expectation of building up the American overseas trade. In fact, instances innumerable could be cited in which governments with direct or indirect grants of money have sought to sustain a flagging or develop a promising industry, too often the result being either a failure or at least a burden.

Japan may profit from a monopoly of camphor in Formosa; but

putting a high arbitrary price on a product is not the best way to hold good customers. One of the largest users of camphor utilizes the gum in celluloid making. Unwilling to pay too high a price for the commodity, desirous doubtless of freedom from foreign control, and anxious to save time and expense of transportation, the concern has set about raising its own supply of camphor on a 12,000-acre plantation in Florida, following up the success attained by the United States Department of Agriculture with a 700-acre grove of camphor trees in the same state.

Government Aids Indian Tea Growers

In India, tea raisers are aided by the government which levies a cess or customers' levy on all tea exports. The cess, collected at trifling cost, and of course paid by foreign buyers, is handed over to a business committee to administer. The funds are used largely for popularizing Indian tea, just as was the money raised by the former Ceylon tea cess. Opinion among rubber planters strongly favors a similar export duty to be expended by a propaganda committee.

Brazil Still Valorizing Coffee

Valorization of coffee is still being carried on by the Brazilian government. It was resumed in the spring of 1921, despite previous experiences that were expensive and unsatisfactory. This latest effort at fixing the price of the commodity appears to be fairly successful. In the first months of 1921, coffee was selling for almost less than it cost to raise it. Then the government took a hand and decreed what the export price should be. The result was that prices nearly doubled between March and November, the rise from April to November being from 5½ to 9 centimos a pound, even with a large increase in foreign sales.

It is stated that the government will continue the valorization of coffee, of which Brazil produces four-fifths of the world supply, in order to securely establish prices and defeat what it believes is a concerted movement on the part of outsiders to depress the value of Brazilian products.

Early in the present year Brazil floated a £7,000,000 loan in London to finance its coffee valorization project, and it is stated that the entire issue was subscribed for immediately.

To summarize, it is evident that commodities have been and still are controlled both as to production and prices. Why not rubber?

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(55) A dealer in rubber manufacturers' supplies wishes addresses of concerns having waste and residue gutta percha to sell.

(56) Addresses of manufacturers of buckles for men's rubber belts are desired.

(57) A foreign correspondent desires information about zinc ethyl-zanthate or zanthogenate.

(58) A foreign manufacturer requests the addresses of concerns making machines for slitting rubber sheets into threads as fine as 1/60-inch.

(59) The inventor of a rubber heel asks for names of manufacturers who would make it on a royalty basis.

(60) A European concern desires samples and quotations on rubber latex for paper making.

(61) Addresses of manufacturers of machinery for making blowout patches with wings are requested.

(62) Addresses of manufacturers of small rubber vacuum cups are desired.

(63) A correspondent desires a laboratory machine for testing the quality of rubber, tints, vulcanizers, etc., combining a washer, heater, mixer, etc.

(64) Inquiry is made for addresses of manufacturers of gutta tissue used by tailors.

(65) A manufacturer desires addresses of concerns making a smooth wrapper or liner for rolling up gummed stock without imprinting on the rubber.

(66) Inquiry is made for addresses of manufacturers of molds made of abcilium alloy.

(67) Request is made for the addresses of manufacturers of hollands for use in the rubber industry.

(68) A manufacturer desiring to experiment with rubber latex requests addresses of dealers who supply it.

(69) Inquiry is made for a wax or other ingredient for use in devulcanizing soft rubber stocks to give products plastic but free from stickiness.

(70) A reader desires addresses of manufacturers of gasket cutters.

(71) A correspondent desires addresses of manufacturers of aluminum rubber molds.

Foreign Trade Opportunities

Addresses and information concerning the inquiries listed below will be supplied to our readers through the Foreign Trade Bureau of The India Rubber World, 25 West 45th street, New York, N. Y. Request for each address should be on a separate sheet and state number.

(3354) Rubber wearing apparel—Scotland. Agency desired by director of a firm, who recently visited United States.

(3355) Hospital equipment—Cuba. For new hospital being built.

(3362) Tires—Belgium. Agency for sale in Belgium and Luxemburg.

(3433) Vulcanizing machine—Canada. Quote f. o. b. port of shipment. Cash. Shipment by rail.

(3439) Elastics—New Zealand. Agency desired. Quote f. o. b. New York or San Francisco.

(3445) Machine for sewing automobile tires—Mexico. Quote, Spanish, f. o. b. place of shipment. Cash.

(3458) Druggists' sundries—England. Firm desires sole agency, will purchase outright if necessary. Quote c. i. f. London or f. o. b. New York.

(3491) Rubber toys—India. Agency desired.

(3503) Rubber goods and hospital equipment—Denmark. Agency desired.

(3522) Artificial leather, motor accessories, and radio apparatus—South Africa. Agencies desired by South African business man visiting United States.

(3562) Balata belting—Sweden. Purchase desired. Quote c. i. f. Helsingborg or Malmö.

(3568) Automobiles, tires and accessories—Spain. Representation desired. Correspondence, Spanish.

(3580) Radio apparatus—Philippines. Catalogs and full information.

(3593) Novelties, men's garters, belts, etc.—Philippines. Exclusive agency on commission basis.

(3607) Elastic—Australia. Agency desired.

(3609) Tires and accessories—Spain. Purchase. Quote, Spanish, f. o. b. New York.

(3613) Tires and accessories—Canada. Purchase and agency. Quote c. i. f. Canadian port.

(3632) Automobile tires and accessories—South Africa. Purchase. Quote f. o. b. New York.

(3650) Fountain pens, artificial leather—South Africa.

(3665) Balata belting, sporting goods—Finland. Purchase and agency. Quote c. i. f. Helsingfors. Payment against documents.

What Rubber Latex Is

The Product of the Tropical Tree—Dairies Discussed

ALTHOUGH some 90,000,000 gallons of rubber milk and 10,000,000 gallons of gutta percha, gutta balata, and other plastic producing milks, are handled annually by gatherers, the commercial world knows very little about it. Of course, until lately, there was little reason why rubber or gutta in its milky form should be of interest. If the world used cow's milk only in the form of cheese, the bulk of mankind would know little about milk itself.

The present world-wide interest in rubber latex in paper manufacture has however, centered the eyes of industry upon it. The following from the West Virginia Pulp & Paper Co. is typical of the paper interest:

"So far as we know, there has been no commerical paper made in which rubber latex has been incorporated. We are now conducting experiments with rubber latex to determine its merits, and if, at a later date, we find that the material does have merit, we will be very glad to communicate with you. We believe that the incorporation of this rubber latex in kraft paper, such as we manufacture, will have merit for insulating and other purposes, but, at the present time, we have not carried our experiments far enough to come to any commercial decision."

Nor is it paper making alone that has waked up. Rubber manufacturers themselves are and have been for a year or more doing much experimenting with latex. The greatest of the world's rubber planting companies has discovered that rubber goods made

Brazilian Method of Latex Gathering

direct from latex instead of coagulated rubber are far stronger, as the following comparative tests show:

ORDINARY RUBBER PRODUCTS

Rubber	100 parts
Zinc oxide	150 parts
Sulphur	10 parts

Tensile strength 2,000 pounds per square inch. Vulcanization at 40 pounds steam pressure for 2 hours.

PRODUCT FROM LATEX

Rubber	100 parts
Zinc oxide	150 parts
Sulphur	10 parts

Tensile strength 3,100 pounds per square inch. Vulcanization at 40 pounds steam pressure for 2 hours.

Such a showing is of the greatest moment, for not only is a far better product obtained but there are other advantages. For example splinters, bark, and earthy matters can be thoroughly eliminated at source. If necessary, another straining can be given

J. H. Crouckewit

Coolie Gathering Latex in Sumatra

at the factory. As for transportation, that is by no means difficult, and methods of factory application to those who are experts in solutions, are already solved.

An indication of the work that is going forward in the use of rubber latex is the fact that Great Britain has already brought in more than 50,000 pounds while the United States has imported about 400,000 pounds.

Countries Where Rubber Is Found

Rubber and rubber latex are products of almost every tropical and subtropical country. Considering first the Americas, rubber is found in Mexico, Guatemala, Nicaragua, British and Spanish Honduras, Costa Rica, Panama, Colombia, Ecuador, Venezuela, the Guianas, Brazil, Bolivia and Peru. In Central Africa, the British, French, Portuguese, and Belgian possessions are all rubber-producing countries. The Near and Far East, Ceylon and Southern India, the Federated Malay States, French Indo-China, Java, Sumatra, British and Dutch Borneo, Oceania, and the Philippine Islands—all contain rubber trees both wild and cultivated. It is also interesting to note that in the United States are to be found annuals, notably the *Aesclepias subulata*, that contain fair amounts of rubber latex.

Most of the rubber used commercially today is furnished by the vast plantations of *Hevea brasiliensis* in Ceylon, the Federated Malay States, and the Dutch East Indies. Much, however, still comes from the wild trees in the Americas and Africa.

Sources of Rubber Milk—Botanical

Although there are hundreds of trees, plants and vines that furnish rubber milk, only a few are of present commercial importance. They are, in the order of their importance:

1. The *Hevea brasiliensis*, which is the source of Pará rubber. It is the tree that furnishes the bulk of the South American rubber as well as that found in the great rubber plantations of the Far East.
2. The *Castilloa ulei* furnishing the caucho of South America.
3. The *Manihot Glaziovii* furnishing Ceará rubber, another South American sort.
4. *Castilloa* elastica from which comes Central American rubber.
5. The *Landolphias*, giant vines, and the *Funtumia elastica* trees furnish the bulk of the African sorts.
6. The Asiatic wild rubbers are from the *Ficus elastica* and the *Dyera costulata* which are abundant milk producers.

One of the best general descriptions of rubber latex is by Seeligman[1] as follows:

"If an incision be made on rubber-bearing plants, there flows from it a milky juice having some resemblance to the milk of the goat. The latex collected therefrom, under suitable manipulation, abandons its suspended microscopical globules to form a more or less white solid matter, which is india rubber. These globules have a diameter of not more than two to three micromillimeters[2] (Adriani). Where the latex is abandoned to itself, the globules gradually separate from the aqueous liquid and form a true cream on the surface. In narrow vessels they aggregate into flakes distributed through the whole liquid.

African Natives Tapping Landolphia Vines

"The properties of latex may be summed up thus: It possesses the density of cream, is slightly amber-colored, mixes with water, but not with naphtha, or any other solvent of india rubber. Its specific gravity varies between 1.02 and 1.41, while that of caoutchouc is 0.930. In regard to its percentage of pure rubber, it varies considerably; the typical latex, that of Pará (Brazil), is composed as follows:

Pure india rubber	32%
Albumenoid extracts and mineral matter	12%
Water	50

"The rubber-yielding milky juice of caoutchouciferous plants is a watery fluid, containing diverse substances in solution, in which there are suspended minute globules of rubber. The milkiness of the juice is due to the difference in the refractive power of the solution and the suspended globules. The latex fails to be differentiated from the juice, from which it essentially differs. The latex is, as a matter of fact, a secretion and—some say—not at all indispensable, to the well-being of the plant. Hence comes the idea that the plant would be perfectly healthy and discharge its functions normally if the latex were collected from it in a rational manner and by a system of tapping which did not injure the vegetable tissues to any great extent. But, in any case, some slight incisions must be made to start the flow."

The Editor Tapping Castilloa in Central America

Preservatives for Latex

Rubber latex will coagulate and oftentimes become putrid a few hours or days after tapping unless a preservative is added. The following have been used or are recommended:

1. The addition of concentrated liquor of ammonia or any combination of nitrogen and carbon.
2. The use of a 3 per cent solution of liquid ammonia.
3. Formaldehyde and boiled water except for Funtumia latex.
4. A decalcifying solution such as a 10 per cent solution of potassium oxalate or sodium fluoride.
5. Alcoholic solutions of creosote, salicylic acid or carbolic acid.
6. Dilution with a weak alkaline solution, then concentration by partial evaporation under reduced pressure at ordinary temperature.
7. A liquid made under a secret formula patented in Brazil and Peru in 1894 by Senhor José Máximo Torres de Frietas.
8. The McGuire patent of British origin covers one of the latest and best methods of latex preservation. The following description is quite complete:

"Any effective alkalized phenol preservative in a solid and concentrated form is prepared by mixing two parts by weight of phenol crystals with one part by weight of caustic soda. The warmed mixture firstly becomes semifluid but gradually assumes

[1] "India Rubber and Gutta Percha." By T. Seeligman, G. Lamy Torrilhon and H. Falconnet. Translated from the French by John Geddes McIntosh. Scott, Greenwood & Son, London, 1910.

[2] A micromillimeter = the thousandth part of a millimeter.

the condition of a fine white powder. This powder can then be pressed into solid blocks of any suitable size or shape, and so long as they are not freely exposed to atmospheric action they will remain in their original condition for an indefinite length of time. The degree of pressure may be varied, but it is found that for making blocks of one pound weight a pressure of from one to two tons per square inch gives satisfactory results.

"In order to protect the blocks from atmospheric action during transport and storage, they are preferably encased with a tin or lead foil or other suitable wrapping and packed for transport in lead-lined wooden boxes of suitable size for convenient transport to the rubber-growing estates, where the blocks only require to be dissolved in the requisite amount of water to constitute an aqueous solution of about 3 to 5 per cent strength before adding to the latex."

Present Sources of Supply

Latex can be secured through almost any of the regular importers of crude rubber as soon as there is a genuine call for it. In the event that they do not believe it worth their personal attention, the Rubber Growers' Association of London will indicate those who can furnish it from the great plantations in the Far East. Nearer to the American consumer is the Government Experiment Station, Port of Spain, Trinidad, B. W. I., which has considerable plantings and is in touch with the rubber plantations on Trinidad and Tabago. The Department of Agriculture, Georgetown, British Guiana; the Department of Agriculture, Paramaribo, Dutch Guiana; and the American-owned plantations in Soconosco, Mexico,—La Zacualpa-Hidalgo Rubber Co. with offices in San Francisco. The last-named write:

"Relative to rubber latex for use in paper manufacture we confess that we were not aware of the fact. We discontinued tapping our trees two years ago. We believe that we could supply from 300 to 400 tons of latex the first year if the price would warrant our getting our full crew together again. We could increase the amount as the underbrush could be cleared, which has of course made great headway during the time we have suspended work."

For those who desire to read up on latex, its handling, and rubber in general the following books and articles, a few out of a great number of valuable contributions, are suggested.

"Rubber: Its Production, Chemistry and Synthesis, in the Light of Recent Research." By A. Dubosc and Dr. A. Luttringer. Translated by Edward W. Lewis, A. C. G. I., F. C. S. Charles Griffin & Co., Ltd., London, 1918.

"Rubber, Gutta Percha and Balata." By Franz Clouth, Cologne. Maclaren & Sons, London, and D. Van Nostrand Co., New York, 1903.

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"Rubber-Content of North American Plants." By Harvey M. Hall and Frances L. Long. Carnegie Institution of Washington, Washington, D. C., 1921.

"Rubber, Its Production and Its Industrial Uses." By Philip Schidrowitz, Ph. D., F. C. S. D. Van Nostrand Co., New York, N. Y., 1911.

"Plantation Rubber and the Testing of Rubber." By G. Stafford Whitby, Ph. D., M. Sc., A. R. C. Sc. Longmans, Green & Co., London, England, 1920.

ALLIS-CHALMERS GETS LARGE ORDER

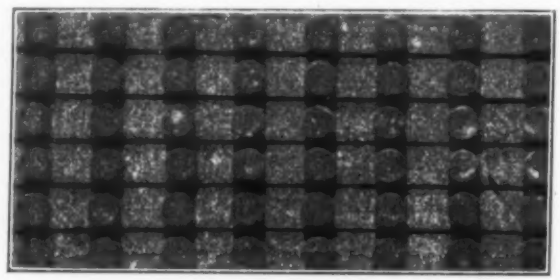
The Allis-Chalmers Manufacturing Co., Milwaukee, Wisconsin, has received an order from the Niagara Falls Power Co. for construction and installation of a complete 70,000 h. p. hydro-electric generating outfit.

Rubber Utilized in Carton Making

Creasing Cartons

In the manufacture of cardboard cartons a rotary press is used to cut and crease the stock for folding. This work is done by a form of brass rules set up on the bed of the press which reciprocates under a wooden pressure cylinder.

The act of cutting and creasing would practically lock each sheet of cardboard to the rule form were it not for special strips of rubber springs arranged along each rule. These rubbers are compressed under the cardboard as the form advances under the press cylinder. The pressure is released as the form returns to its initial position. The spring of the rubber then raises the sheet from the rules and permits it to be easily removed by hand.



Sheet Spring Strips for Creasing Press

Strip springs for this purpose are molded in sheet form from calendered rubber in a metal mold. These strips, shown in the illustration, consist of a series of raised cylindrical plugs about ¼-inch in diameter by ⅛-inch high, spaced about ⅜-inch apart on a base ⅛-inch thick. Each strip in the sheet is separated from the next by a molded groove of slight depth which serves as a guide in cutting the strips apart.

Gluing Windows in Cartons

Windows in cartons used for displaying crackers, biscuits and other grocery wares are commonly made of a sheet of hard thin gelatine attached by glue applied around the opening on the inside of the carton. The application of the glue is effected by a rubber stamp mounted on a block through which a hole positions the glue imprint.

Cartons, in the flat, are piled face downward on a board on which a wood mandrel fitting the window opening projects through the cartons. This mandrel guides the stamp so that the glue is accurately imprinted around the window opening. Each carton is removed in turn as stamped. Ordinary glue is used, thinned with acetic acid, and spread on a glass surface. The function of the acetic acid is to improve the attachment of the glue to the gelatine by removal of the glossy surface of the latter by solvent action.

SALE OF RUBBER PLANTATIONS IN THE KAMERUN

Certain ex-enemy properties in the British sphere of the Kamerun, West Africa, are to be placed on sale, by direction of the British Government. These properties include not only banana, tobacco, and sugar lands, but also cacao, oil palm, and rubber plantations, of various areas from 200 to 35,000 acres. Many of these plantations are in full bearing and in good working order, with estate buildings and rubber curing factories in good condition. All the above properties will be sold at auction at Winchester House, Old Broad street, London, E. C., England, on October 11 and 12, 1922. Full particulars may be obtained from the auctioneers, Hampton & Sons, 20 St. James Square, London, S. W. 1, England.

Rolling Resistance of Rubber Tires

Rear Wheel Dynamometer—Measuring Tire Resistance—Solid Tire Tests—Cord and Fabric Tire Tests—Resistance Less in Cord Tires—Loss of Power in Tires

By E. H. Lockwood[1]

CONSIDERABLE information is now at hand on the rolling resistance of rubber tires, mostly derived from recent laboratory tests. Investigations are still in progress by which the present information soon will be confirmed and amplified. In the light of present knowledge it is scarcely too much to say that power loss in tires can now be predicted with as much certainty as that of gears or bearings.

Of the different researches in tire friction, one of the earliest was that carried on at Yale University. These experiments were made by placing the test tires on the rear wheels of a vehicle, using a rear wheel dynamometer for resistance measurements. The dynamometer itself was the product of two laboratories. The drums and shaft were designed and built by the Automobile Club of America for its research laboratory in New York. No pains or expense were spared to make the drums strong and durable. They were of large diameter, nearly twice that of an average tire. Their faces were made of compressed paper and afforded excellent traction, much like that of smooth wood block pavement.

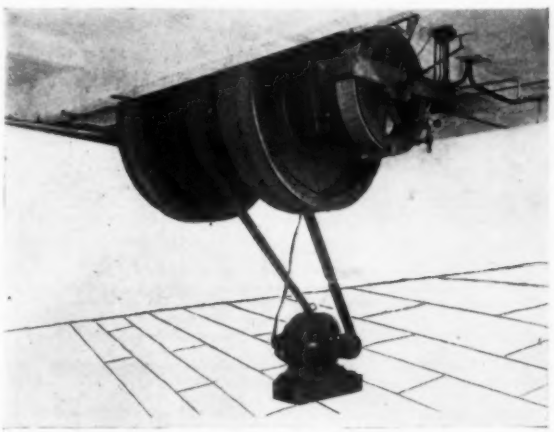


FIG. 1. BASEMENT VIEW OF DRUMS DRIVING MOTOR AND ROPE BRAKE DYNAMOMETER

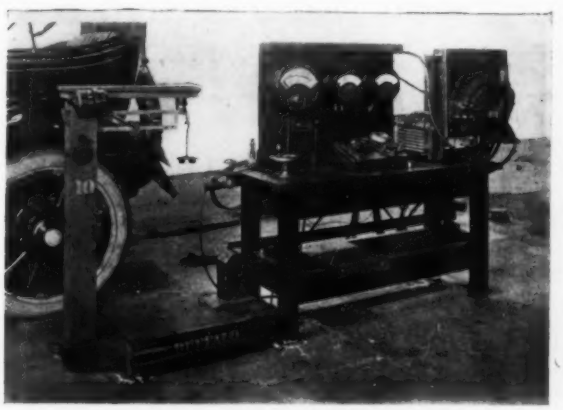


FIG. 2. MAIN FLOOR VIEW OF CONTROL APPARATUS AND CAR IN POSITION FOR TEST

Rear Wheel Dynamometer at Yale University

The Rear Wheel Dynamometer

When the drums were transferred to the Mason Laboratory, Yale University, in 1913, a new power dynamometer was devised. A small electric motor with belt drive was used to rotate the drums for friction measurements. All power measurements were made by a large rope brake dynamometer, using a water cooled pulley on the drum shaft. Fig. 1 is a general view of the drums, with rope brake dynamometer, electric motor and belt drive. This illustration shows that the drum shaft is suspended from the basement ceiling by drop hangers. The tops of the drums are flush with the main floor through openings cut in the concrete. The pull of the brake arm is transferred by a vertical link to platform scales on the main floor. The adjustment of the brake band is made by a control handle located near the scales, facing the tachometer and electric meters. This part of the apparatus, including the rear wheels of a test car, is shown in Fig. 2.

From this description it will be plain that tires are tested on this apparatus by placing the vehicle wheels on the drums, where they are rotated while the measurements are being made. It has the advantage of applying the load to the tire by the car springs in the usual way. It shares the disadvantage of all drum equipment, that the tire is continually being flexed on a *curved* instead of a flat surface, hence probably offers more resistance.

Method of Measuring Resistance

The method of measuring tire resistance on this apparatus is somewhat cumbersome, since it requires two separate operations for each measurement. First, the drums and tires are rotated by the electric motor, consuming a certain amount of current which is indicated by the meters. The electric current measures the energy required to rotate the entire system, part of which is consumed by resistance of the tires. Second, the axle is lifted by screw jacks until the tires rest lightly on the drums, enough to drive the wheels but not to flatten the rubber. When rotated in this position less current is used, showing that the jacked-up tire offers less resistance. To measure this loss, the rope brake tension is increased until the original current reading is restored. The tire resistance is measured by the increase of pull registered by the rope brake scales. It is evident that the *increase* of brake resistance is equal to the *decrease* of resistance of the jacked-up tire, since both are measured by the same amount of current.

The method described above is approximately correct. When the wheels are jacked up less current is used, not only because of the absence of tire resistance, but because of lessened friction of wheel and drum bearings. It follows that the added brake load represents not only tire resistance but some bearing resistance. Allowance can be made for bearing friction, but usually this has not been done because of its smallness when compared with tire resistance. For comparative purposes, the uncorrected and the

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corrected figures have been found equally useful in practice.

Before stating the results of tire tests it will be in order to explain the units employed for resistance measurements. Resistance is produced by the flexure of the tire at contact with drum or road. It is measured by the force, or pull, at the axle required to overcome the internal stresses in the tire as it flexes and rolls

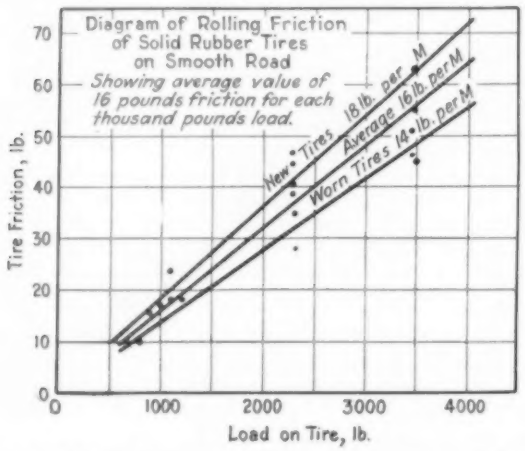


FIG. 3. ROLLING RESISTANCE OF SOLID RUBBER TIRES, SHOWING AVERAGE RESISTANCE OF 16 POUNDS FOR EACH 1000 POUNDS LOAD

along. Resistance can be measured in *pounds*, using the unit just described, or it can be measured in *horsepower*, the tractive force times the car speed, etc. There are advantages in each unit, but for the purposes of this discussion the simpler unit, pounds, will be used.

Testing Solid Tires

Tests of solid rubber tires will be considered first, as they are somewhat simpler to deal with than pneumatic tires. Solid rubber tires are popularly supposed to offer more resistance than pneumatic tires. Tests prove, however, that on smooth surfaces such as the drums, solid rubber tires roll more easily than fabric tires under the same load. Sizes have been tested from 34 by 3½ to 40 by 12, with axle loads from 1,000 to 3,500 pounds. Owing to limitation of the apparatus, the largest sizes could not be tested to maximum loads.

The rotative speed was found to have but little effect on solid tire resistance, and in this respect solid and pneumatic tires are similar. Tests were made on new tires from several different makers, with varying depth of rubber and construction details. It was observed that these differed considerably in rolling resistance. Comparing the results with well-worn tires, it was also observed that the new tires, with springy rubber cushion, offered more resistance than old tires with the rubber worn down. The average rolling resistance was found to be practically the same for all sizes, and to depend only on the axle load.

Its value may be stated in units of "pounds per 1000 pounds" of load, or briefly, "lbs. per M." This unit is more convenient than the older "pounds per ton," which is ambiguous because the ton has two values in common use.

Stated in units of pounds per 1000, the rolling resistance of solid rubber tires may be given by the following approximate figures:

High (new tires, deep rubber)	18
Average	16
Low (worn tires, thin rubber)	14

These values were derived from Fig. 3, where the results of many tests are plotted, with the load on the horizontal axis and the resistance on the vertical axis. It will be shown later that the resistance of fabric tires is about equal to the "high" value stated and the resistance of cord tires is somewhat less than the "low" value for solid rubber. This is illustrated in Fig. 4.

It will be well at this point to digress for a moment to show what rolling resistance means in a solid rubber tire. Suppose a truck to have average tires, carrying 10,000 pounds total load. Its rolling resistance by the rule will be 10 by 16 = 160 pounds. At 15 miles per hour this will be equivalent to 7 horsepower, all of which will be spent within the tires compressing the rubber, and ultimately will appear as heat to be absorbed and dissipated by the rubber and metal rim.

It should be said that the above figures relate only to the resistance offered by the tires. There will be additional resistance from bearings and transmission, amounting to approximately half that of the tires, which will appear as heat in the bearings, brakes, gear box, etc.

Testing Cord and Fabric Tires

Tests of fabric and cord penumatic tires have been conducted under identical conditions of load and inflation pressure, in order to study the actual differences in these two types. The loads for each tire were taken at approximately 100, 75 and 50 per cent of the maximum recommended by the makers.

The inflations were carried over a considerable range, starting at 30 pounds per square inch. The combination of loads and inflations required twelve tests for each tire, each of which was run at three different speeds. As before stated, the values for the different speeds (20 to 40 m. p. h.) differed but little from each other, hence the results were averaged and given as a single figure suitable for all speeds.

Fig. 4 is a comprehensive diagram of rolling resistance of pneumatic tires. It applies to two sizes of fabric and cord tires,

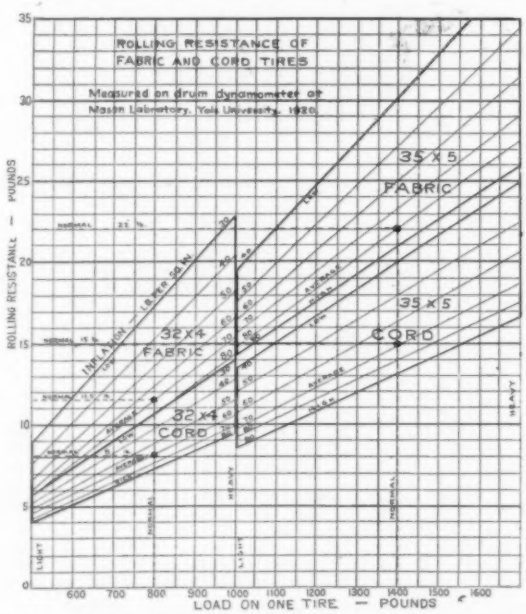


FIG. 4. ROLLING RESISTANCE OF FABRIC CORD TIRES SHOWING THE CORD TIRE RESISTANCE IS TWO-THIRDS THAT OF FABRIC TIRES

giving for each the variation of rolling resistance for a wide range of axle loads and inflation pressures.

In the diagram, loads are plotted on the horizontal axis, resistance on the vertical axis, and inflation on the inclined straight lines. In this diagram fabric and cord areas occupy different fields, where their comparative values may be easily studied. In general, for the same loads and inflation, cord tire resistance will be about two-thirds of that of fabric tires. Examples are given on the diagram by dotted lines, showing the resistance for loads

of 800 pounds on the small tire and 1,400 pounds on the large tire.

The diagram shows that for a given load, the resistance varies considerably with the inflation pressure, and may change by as much as 25 per cent. Fabric tires are affected by pressure changes more than cord tires. The load carried by the tire affects the resistance, as shown by the slope of the lines on the diagram. These lines are practically straight and slope in the general direction of the origin of coordinates, showing that the resistance varies in about the same proportion as the load.

Resistance Less in Cord Than Fabric Tires

Comparing the two sizes of tires, it will be seen that at about 70 pounds' inflation the lines coincide in both diagrams. This leads to the interesting conclusion that for well-inflated tires, either fabric or cord, the resistance can be expressed as the same function of the load for all sizes of tires. This has been proven by tests for the 4 and 5-inch and undoubtedly holds also for the 3-inch and 6-inch sizes lying outside the diagram. The resistance equation for fabric tires at inflation 70 is: $R = 18\,M - 3$. The resistance equation for cord tires at inflation 70 is: $R = 12\,M - 2$. The corresponding equation for solid rubber tires is: $R = 16\,M$.

The tire resistance diagram, Fig. 4, was based on tests of tires of the same make for sake of uniformity. Similar tests of other makes have shown that, for several of the largest manufacturers, the resistances are practically indentical with those given on the diagram. This leads to the conclusion that the processes of manufacture have become standardized so that consistent results will be obtained from all the leading makes. A few tires have been found showing higher friction, all made by smaller or newly formed companies.

That tire construction has improved in recent years is a well-known fact, attested by greater average mileage obtained. It is significant that tires tested in 1917 offered noticeably more rolling resistance than the same make of tires three years later. That increased durability and decreased rolling resistance should accompany each other is not surprising.

Among the minor points noted by these tests was the effect of non-skid treads on rolling resistance. Repeated tests of tires of the same make have shown that the non-skid tread offers from five to eight per cent more resistance than the plain or ribbed tread. Some of the non-skid treads emitted a musical note by squeezing air from the tread pockets. This noise was quite pronounced, but apparently produced no increase in rolling resistance.

Power Loss Is Large

The loss of power in rubber tires is undeniably large. The loss was reduced about one-third by the advent of the cord tire, but still remains much larger than all the other friction losses combined. The source of the loss is undoubtedly in the continuous kneading action in the loaded tire. The rubber is not perfectly elastic, like a steel spring, but absorbs part of the work of compression instead of giving it all back. This inelastic property is found in solid rubber and pneumatic tires to about the same degree, although the cord tire carcass has a slight advantage at present.

The relation which rolling resistance of the tires bears to the total resistance met on a smooth road may be stated as follows, the figures being for a 3,000-pound car with 750 pounds load, speed of 25 miles per hour:

	Pounds	Per Cent
Tire resistance (cord)	40	38.5
Bearing and transmission	24	23.0
Wind resistance	40	38.5
Totals	104	100.0

At this speed the resistance offered by the tires is equal to that of the wind, and each is more than one-third of the total resistance. Translated into horsepower, the total resistance calls for 7 horsepower from the motor on a level road. The tire resistance absorbs 2.5 horsepower, all of which is converted into heat within the rubber. This horsepower would generate 6,400 heat units per hour, and would maintain a surface temperature of the tires at least thirty degrees above the surrounding air.

THE TIRE AND RIM ASSOCIATION OF AMERICA, INC.

On August 31 was held the first meeting of The Tire and Rim Association of America, Inc., a body which will take over and continue the activities of the former Tire and Rim Association. The new organization includes in its membership men connected with the tire, rim, wheel and related parts industries, while it will be governed by a board of directors composed of fifteen members. These officials, and the companies with which they are connected, are as follows:

Tires. J. E. Hale, The Firestone Tire & Rubber Co.; J. D. Anderson, The Fisk Rubber Co.; W. H. Allen, The B. F. Goodrich Co.; B. Darrow, The Goodyear Tire & Rubber Co.; E. O. Fritch, Hood Rubber Co.; C. F. Offensend, The Miller Rubber Co.; S. P. Thacher, United States Rubber Co.

Rims. J. H. Wagonhorst, Hayes Wheel Co.; W. B. Minch, Jaxon Steel Products Co.; Ford Lawrence, Kelsey Wheel Co.; John Younger, Standard Parts Co.

Wheels. P. Pleiss, Budd Wheel Co.; C. C. Carlton, Motor Wheel Corporation; O. J. Rohde, Wire Wheel Corporation of America.

Related Parts. W. J. Kirkpatrick, A. Schrader's Son, Inc.

The first meeting of the Board of Directors was held immediately after the meeting of the incorporators and the following officers were elected: S. P. Thacher, president; John Younger, vice-president; C. A. Thompson, secretary; H. W. Kranz, treasurer.

Mr. Thompson also remains as general manager and C. E. Bonnett as chief rim inspector.

The new association covers the entire field of tire and rim standardization while continuing the work of rim inspection and its plans include close cooperation with other bodies engaged in related work. Its immediate goal is the enrolling in its membership of every tire, rim, wheel and related parts manufacturer in the United States and Canada. In addition to the home office of the corporation, in Hartford, the new association will continue to use the offices occupied by The Tire and Rim Association in the Leader-News Building, Cleveland, Ohio.

OLD TRUCK TIRES BEING SOLD AS NEW

The vigilance committee of the Associated Advertising Clubs of the World, whose motto is "Truth," has issued a warning to the effect that certain eastern tire distributers are attempting to dispose of weather-worn and deteriorated solid truck tires, some of which are the reimported surplus stock of the American Expeditionary Forces in France, by cutting the registered tread designs of standard makes into smooth-tread tires with a pneumatic tool and offering them for sale at bargain prices. Firestone, Goodrich, Goodyear, Kelly-Springfield and United States are the treads most commonly imitated, and prospective purchasers are led to believe that these are first quality new tread tires exactly as received from the manufacturers.

These pirated tread tires can usually be detected, however, by crude cutting of the design, the absence of the usual mold marks, and the marked profile difference between the genuine and imitated tires. They will not render the service to be expected of genuine tires, owing to their deteriorated condition, lesser height of profile and the fact that the compound is not as long-wearing as that needed to permit building it into a high profile non-skid tread design.

Molded Shellac Compositions

Shellac in Rubber Compounding—Molded Shellac Products—Manufacturing Methods and Machines —Making Phonograph Records

SHELLAC almost from the beginning has been used in rubber compounding. One has only to recall the days of gossamer clothing, where it was very generally used, to prove this, although the proportion in each batch was small. The French experimenter Normandy, however, claimed that treating shellac first with sulphuric acid and dissolving the mass in "hydrate of protoxide of amyl," he got a waterproof flexible product that needed little or no rubber. In cements for a great variety of purposes, shellac, combined with rubber or gutta percha, has always been used, particularly for those that grew hard in cooling. Added to a rubber mixture, shellac not only toughens it but renders it impermeable to gas. The gas tubing compound of the veteran rubber manufacturer Mayall, consisting of rubber, shellac, oxide of zinc, pipe clay and sulphur, is a case in point. The makers of insulated wire and deep sea cables also brought out many combinations of shellac, gutta percha and rubber, the shellac both toughening the covering and making it more resistant. In hard rubber the inventors have made much use of it. They used finely ground fibers, powdered vulcanized rubber, earthy materials and sulphur, advising great pressure and heat in the molding.

Thus it would seem that manufacturers of shellac goods might profit by an added use of rubber, and conversely that rubber manufacturers should look more carefully into the use of shellac. Of interest to each class is the following description of work in shellac molding.

Molded Shellac Articles

Shellac compositions used in making molded articles were introduced over 50 years ago. The industrial development of these plastics began about 1870 in the American button manufacturing trade.[1] They still remain the chief button material for cheap clothing because their lustrous finish direct from the mold requires no polishing; a variety of color effects are possible; and the material is cheap and worked with great facility.

Shellac compositions mold without shrinkage and possess low heat resistance, softening at 150 degrees F. They have excellent insulating properties and find many applications for indoor electric fittings such as lamp sockets, bushings, switches, etc. In general these stocks are applicable to purposes where the conditions of service do not involve chemical action, mechanical strain, heat or weather exposure. Such requirements are met by the phenolic resin compounds which thus have a wider range of usefulness.

Shellac compositions are less expensive than other molded plastics and therefore by their excellence of finish are available for the manufacture of such articles as buttons, handles, boxes, caps, knobs, game counters, checkers, camera and music roll parts, novelties in great variety, and phonograph records. For the latter purpose a very dense stock of special quality is required.

Shellac Molding Stocks

Shellac molding stocks consist of shellac as a binder and various inert filling materials and pigments. The hardening of the composition is effected entirely by cooling and not by chemical action as in the case of phenolic condensation products or rubber. In the best plastic mixtures of the shellac type the binder or gum ingredient is the best quality of shellac, known commercially as T. N. grade, signifying "true natural," or unbleached orange shellac. Cheaper gums are often substituted, such as dammar, copal, Manila or other hard gums and rosin.

[1] THE INDIA RUBBER WORLD, August 1, 1922, 733-734.

For radio instrument parts copal is preferred to shellac and mica and asbestos to clay for filling, since the stock is not required to have the density needed for phonograph records. The usual amount of binder for a workable stock is about 15 per cent.

Compounding Ingredients

The compounding ingredients used in shellac stocks are much fewer in number than in the case of rubber mixings. They consist essentially of inert earthy fillers and mineral colors, chiefly oxides, and commonly include the following: barytes, talc, china clay, whiting, silica, fossil flour, rotten stone, asbestos, mica, carbon or gas black, red oxide of iron, umber, and ochre.

Mixing Operations

The operation of mixing is done on the regular two-roll mill used for rubber work. The rolls are heated with steam at about 100 pounds pressure to melt the gum easily. Two workmen are required for each mill, working opposite at each roll. The shellac and compounding ingredients are weighed into separate containers.

At the beginning of the mixing operation the hot rolls are set close together, the shellac is thrown in the mill, melts and adheres to the fast roll. The earthy matters are then added by one operator as fast as they are absorbed by the gum while the second man adds the material that falls into the mill pan, and at intervals regulates the spacing of the rolls to accommodate the mixed batch as it builds up on the roll.

The separation of the rolls for the finished batch is about three-quarters of an inch. Thirty minutes are required to mix a batch. A hand-operated scraper is arranged on the mill frame for removing the hot stock in rough sheets of convenient size for handling. These are not allowed to cool but are taken at once to the blanking machine and run out into thin sheets marked or creased by the blanking roll into rectangles containing the amount needed for a single mold cavity.

Blanking Machine

The arrangement of the blanking machine is illustrated diagrammatically in Fig. 1. The machine consists of a pair of even motion rolls A and B arranged for water cooling as required. Above these on either side are inclined sheet iron shelves C and

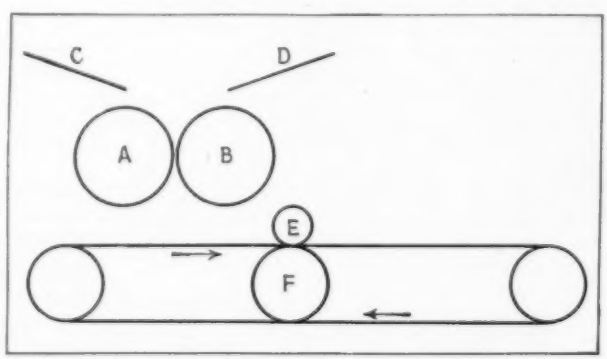


Fig. 1. Diagram of Blanking Machine

D, from which the thick sheet stock is fed into the rolls from which it emerges below as a trimmed firm sheet 3/16-inch thick. It is carried by an endless belt under the sheeting rolls and

passes between a second pair of cool rolls E and F, of which E has raised flanged ends and the surface divided both ways by steel cutting edges which mark the sheet into rectangles by cutting partly through them.

The marked stock is removed from the blanking machine by an endless conveyor belt and cooled previous to being taken to the press room for molding.

Molding Operations

Ordinary single or multiple opening hydraulic or toggle platen presses are used for pressing work in hand-operated molds. Semi-automatic presses are also used for rapid production of small articles.

The molds are of either open or closed type, as shown in Figs. 2 and 3. In the first style mentioned the mold is closed by a cover and the excess material emerges from between the mold and cover as flash or overflow, while in the second, the mold is closed and its contents compressed by a descending plunger. The stock

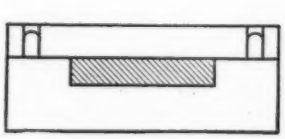


Fig. 2. Open Mold

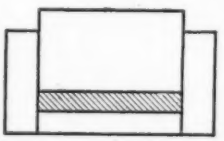


Fig. 3. Plunger Mold

is heated on a steam plate to soften it to putty-like consistency. In the mold it is pressed and hardened by cooling.

Phonograph Records

The highest development of shellac composition molding is represented by phonograph disk records. Originally these records were made of hard rubber and were successful from the standpoint of perfection in molding and sonorescence. However, the stock was too expensive and vulcanization too slow for commercial production. This led to search for a substitute. The greatest difficulty encountered was elimination of the scratchy sounds as compared with the smoothness of sound given by disks of hard rubber.

The original shellac records were produced in 1888-1889 by Joseph Rockhill, now president of the General Insulate Co., Brooklyn, N. Y., for Emil Berliner, inventor. Large numbers of these disks seven inches in diameter were made by the Electrose Co., Brooklyn, N. Y., and the Duraloid Co., Newark, N. J., for the Victor Talking Machine Co. until the latter company took up the manufacture of its own records.

Making Phonograph Records

Stock for phonograph records must be tough and free from grit, and much denser than that for ordinary shellac molded articles. The following is a practical record formula and suited for any molded article in which superior quality and finish is desired:

FORMULA

Silica, 400-mesh	24
China clay	32
Blanc fixe	16
T. N. shellac	24
Cotton flock	2
Rosin	3
Gas black	4
	105

The silica is used to transfer wear from the record to the steel playing needle; however, rotten stone can be substituted for silica. Cotton flock is fine powdered cotton fiber made by grinding cotton waste, or scrap cotton fabrics. It adds strength and toughness to the composition.

The processes involved in producing the mold or pressing matrix for a phonograph record are very interesting features of highly specialized mold making. The steps involved are as follows: (1) Positive original, master record cut in wax; (2) negative copper master matrix; (3) positive silver mother record; (4) negative nickel pressing matrix mounted in mold.

Recording Wax

The material upon which the original record is made, although termed wax, is actually a special soap or sodium stearate hardened by metallic salts. This material possesses requisite hardness, durability and smooth cutting quality necessary for making a permanent, clear, sharp record. The familiar recording cylinders used on the dictagraph are examples of this recording wax.

Master Matrix

The cast wax disk is faced in a lathe with a sapphire tipped tool preparatory to receiving the original record which is cut by a sapphire point by the recording instrument. The lustrous plain surface seen on a finished record shows the smoothness of the sapphire cut which needs no polish.

The master matrix is negative. It is derived from the wax original, the face of which is graphited and electroplated with copper for 36 hours.

Mother Record

The positive mother record is obtained by electroplating on the master matrix with silver backed with an electroplate of copper. From the mother record as many pressing matrices are made as required.

Pressing Matrix

The silver face of the mother record is slightly oxidized by application of dilute iodine solution to permit removal of the electroplated nickel reproduction or negative pressing matrix. The nickel face is backed with heavy electroplate of copper. The pressing matrix is mounted in a steel mold of plunger type.

Molding Presses

A power toggle press, illustrated in Fig. 4, with a single pair of water-cooled platens is used for molding. In making records,

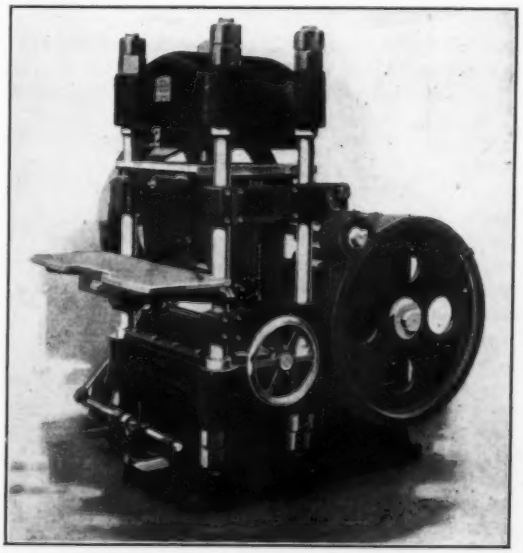


Fig. 4. Toggle Press

the size of press is that for one mold only. The press has three crankshafts which come to dead center at the same time and exert 1,600 pounds' pressure per square inch on the record.

Mold Features

The lower section of the two-part steel mold contains a center pin which serves to center the punched paper record label, form the hole in the record, and guide the closure of the mold. In a mold for a double face record both parts contain center guide pins.

Molding Operation

The plan of press unit for two operators making records is shown in Fig. 5, A and B indicate presses with mold set at

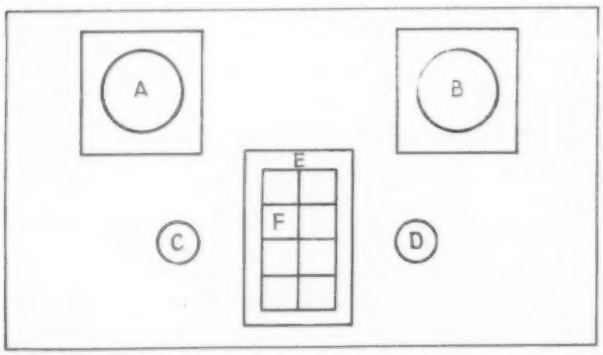


Fig. 5. Plan of Press Unit for Two Operators

proper height for the seated operators C and D, to handle the work conveniently. A steam heated stock table E, holding blanked stock F, is located between the workers. Over E is placed a shelf for holding a supply of cold blanked stock.

To form a record the operator places a label face downward over the mold pin and with a spatula scrapes a square of soft stock from the steam plate E, replacing it with a cold piece from the shelf above. The corners of the hot stock are folded to the center, and the edges rolled in slightly, giving the material a ball form about a quarter of the mold in diameter. The mass is then pushed down over the center pin and the press closed upon it. The plastic stock flows very freely to fill the cavity. A perfectly hardened reproduction of the matrix is obtained after cooling 35 seconds in the mold.

The amount of stock for each record is proportioned to fill the mold with but slight overflow. This, the press operator, usually a girl, cracks off by hand, laying the finished record aside in a pile to be removed for inspection and packing. The output of each operator per day is 750 records from one mold.

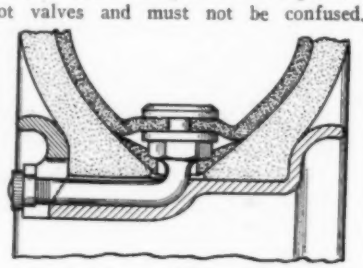
The life of a press matrix is about 2,000 impressions. After that number of records have been molded the matrix, for some distance around the center, shows a crystalline appearance due to abrasion by the mineral ingredients as the stock flows across the mold. The flash or mold waste is ground and bolted for reuse in new batches. This is found to be the most certain process to eliminate foreign matter.

Ordinary Composition Mold Work

Molded articles generally, are formed from shellac composition in case hardened polished steel molds filled with hot blanked stock roughly shaped and filled into the mold cavity by hand. In this work mold design is a matter of greatest importance particularly where inserts are to be incorporated in the objects molded. As a rule molds are designed and made by the manufacturers of composition goods. Shellac products are constantly increasing through broader knowledge of the possibilities in this field of manufacture.

STANDARD VALVE STEMS[1]

For inflation of tires on disk wheels the problem is a question of valve stems and not valves and must not be confused. To meet present disk wheel conditions for the various sizes of tubes, six or seven different lengths of valve stems are required. The only completely standardized element of wheel construction of whatever type is the standard rim. It is necessary to standardize the valve stem relatively to the rim, defining and standardizing its length and position relative to the rim only.



Proposed Standard Valve Stem for Disk Wheels

The accompanying cross-sectional view shows the location of the proposed standard valve stem and its accessibility. This valve stem would be 10 to 20 per cent cheaper than the present valve stems and more convenient in every way.

[1]W. J. P. Moore in Automotive Industries, March 30, 1922.

Brazil Celebrates Hundredth Anniversary of Independence

Brazil's celebration of the one hundredth anniversary of her independence was ushered in on September 7, at Rio de Janeiro, by great rejoicings and festivities. On that day a large civic parade took place, while the country's regular troops, reserves, marines, military police, and the crews of visiting warships were reviewed by President Epitacio Pessoa and the entire Cabinet, accompanied by diplomats and members of foreign missions.

For this occasion the United States has erected the building, here pictured, which will serve as the American Embassy at the close of the Exposition, which will take place March 31, 1923.

United States Embassy, Rio de Janeiro, Brazil

Rubber Division, American Chemical Society

THE sixty-fourth meeting of the American Chemical Society was held at the Carnegie Institute of Technology, Pittsburgh, Pennsylvania, September 4 to 8, 1922. The Rubber Division program included a list of 22 interesting and important papers. The sessions were well attended and much interest was shown in the discussion of papers. Committee reports were not the subject of important action. The Executive Committee made no report. The Accelerator Committee reported additions and corrections of trade named accelerators to the confidential list already compiled. The Committee on Physical Testing recommended standardization of testing machines, test compounds, cures and methods of tests. The report was referred back to the committee. The same action was taken on the report on analytical standardization.

E. B. Spear
Vice-Chairman

W. B. Wiegand
Chairman

A. H. Smith
Secretary

Officers of the Rubber Division of the American Chemical Society

The following divisional officers were elected for the ensuing year: W. B. Wiegand, chairman; Ellwood B. Spear, vice-chairman; A. H. Smith, secretary, and C. W. Bedford, chairman of the executive committee, the remaining members of which are: D. F. Cranor, G. F. Whitby, H. L. Fisher, and N. A. Shepard.

Abstracts of Papers

Zinc Oxide in a New Physical Condition. Its Effects Upon Rubber Compounds. A new form of zinc oxide is described which by average measurement is about one-fifth the size of the present marketed product. Its effect seems to be much greater than this ratio in size. In compounding rubber with this zinc oxide very much more energy is required to push the oxide into the rubber mix and considerably more heat is therefore developed. The curing is effected in 30 to 40 minutes as against 150 minutes with ordinary oxide and the tensile strength increased from 2,800 to 3,500. The striking thing about this mix is that when an accelerator is compounded with it in addition to the zinc oxide and sulphur, the curing time is not diminished at all and the tensile strength is increased to 3,800. Mr. Breyer claims that it is only necessary to state that the new zinc oxide has a definite absorptive affinity for sulphur, which affinity is poisoned to some extent by the introduction of acidic impurities.—Frank G. Breyer, The New Jersey Zinc Co.

Effect of Certain Tread Pigments on Temperature Developed in Pneumatic Tires. The paper presents a short description of tread compounds, their stress-strain curves, theoretical conductivity calculated by Williams' formula, and the actual service heat of tires built with these treads; the road temperatures being taken by means of a thermo-couple inserted by the awl as devised by The New Jersey Zinc Co.'s research department.—D. F. Cranor.

Disubstituted Guanidines. Notes on the chemistry of diphenylguanidine and some compounding data on various disubstituted guanidines.—Winfield Scott.

An Abrasion Machine by Which Comparative Wear Tests Can Be Made on Laboratory Test Pieces or on Sections Cut from Tire Treads. Description of a simple abrasion machine, on which laboratory test pieces or sections cut from tire treads can be tested for comparative resistance to the abrading influence of surfaces of known composition. The test pieces, fastened at one end only, are held against a common, uniformly moving, abrading surface with a definite uniform pressure. The effect of pressure upon the test piece and the effects of speed, and composition of the abrading surface are discussed and a comparison made of this method of testing with the loose abrasive method. Comparisons are also made by service tests on tires and heels.—H. A. Depew.

The Results of Variation in the Sulphur and Hexamethylene Tetramine Content on Some of the Properties of Compounded Rubber. A non-blooming compound must not contain more than one per cent of free sulphur calculated on the rubber. Using hexamethylene tetramine as an accelerator, the tensile strength, elongation, and maximal area under the stress-strain curve increase with a decrease in the amount of sulphur used, and to a lesser extent are increased by using a large amount of accelerator. The shape of the stress-strain curve is not affected by the sulphur and accelerator content. The vulcanization coefficient at the optimum cure depends on the sulphur content.—H. A. Depew.

The Microscopic Examination of Rubber Compounds Containing Antimony Pigments. To secure a section of a rubber compound sufficiently thin for microscopic examination, some method of hardening must be employed previous to sectioning. Sulphur monochloride has been successfully used for this purpose, but the reagent attacks and destroys the identity of the sulphides of antimony. A bath of molten sulphur may be used to produce the required rigidity without materially altering the appearance of the antimony pigments. Photomicrographs illustrating the new method are shown.—A. F. Hardman.

The Limitations of the Obscuring Power Test for Compounding Materials. Experimental evidence is presented in this article that the obscuring power test for compounding materials is unreliable and often misleading in the region where the diameter of the particles is in the neighborhood of one quarter of the wave length of light, that is 0.1 mu.—Ellwood B. Spear and H. A. Endres, Akron, Ohio.

The Crystallization of Sulphur in Rubber and the Phenomenon of "Blooming." I. A solution of sulphur in rubber exhibits the same phenomena of diffusion, crystallization and supersaturation as are shown by solutions of sulphur in other solvents. When rubber saturated with sulphur at calendering or vulcanizing temperatures is cooled, the solubility is exceeded and the excess sulphur separates as supercooled globules, dendrites, or stable rhombic crys-

tals, depending upon the rate of cooling. Sulphur bloom is always composed of rhombic sulphur; the stable form at room temperature. It may be caused by crystallization at the surface of the rubber, either directly from solution or by transformation from supercooled globules or dendrites.—Herbert A. Andres.

The Measurement of Temperature in Rubber Articles by Means of Thermo-Couples. Measurements of the temperature in rubber articles by thermo-couples are all too low where the depth of insertion is not great and where there is at the same time a temperature differential along the buried portion of the thermo-couple wires. The correction to be applied depends upon the depth of insertion, the size of wires constituting the thermo-couple, and the temperature differential. A new method is given for measuring the temperature in pneumatic and solid tires. Correction curves are given for use where ordinary thermo-couples have been employed.—Ellwood B. Spear and J. F. Purdy, Akron, Ohio.

A Method for the Measurement of Resistance to Tear in Vulcanized Rubber. A method is presented for measuring the resistance to tear of vulcanized rubber in terms of work. In this test a sheet of rubber 0.1-inch thick is supported between hooks on the ordinary tensile testing machine, and an autographic chart is taken as the rubber is torn. Resistance to tear is expressed as inch-pounds per square inch of rubber torn, in the formula:

$$W = \frac{KA - \frac{Fe}{2}}{Lt}$$

in which "K" is a constant, "A" is the work area on chart, "L" is the distance torn, "t" is the thickness, "e" and "F" are the elongation and force in equilibrium at the end of the test. Some data are given of resistance to tear in zinc oxide and pure gum stocks.—Erle C. Zimmerman.

Thermal Changes During Vulcanization. The measurement of the temperature developed in the center of a cylinder of rubber sulphur mixture which is immersed in a constant temperature bath shows that heat is liberated during the first stages of the reaction. An absorption of heat is indicated during the later stages. The extent of these thermal changes has been estimated when stocks of different sulphur and accelerator content were cured at different temperatures. The relationship between the temperature developed and the per cent combined sulphur is given.—Ira Williams and D. J. Beaver, Research Laboratories, Firestone Tire & Rubber Company, Akron, Ohio.

The Influence of Certain Compounding Ingredients in Hard Rubber. Several articles have been published showing the action of compounding ingredients in soft rubber goods. Very little has been published thus far with regard to the principles of hard rubber compounding. Graphs are shown which indicate the mass action effect of sulphur, the curing properties of lime and magnesia, and the loading qualities of M. R., tire reclaim, and resin in hard rubber mixtures.—W. E. Glancy.

A Convenient Nomograph for Rubber Chemists. Rubber chemists frequently have use for tables available for converting the cure of a rubber stock from a known temperature and time to a different temperature and corresponding time. A formula has been derived from experimental values and a nomograph constructed whereby it is possible to find quickly the desired cure.—W. R. Hickler and W. E. Glancy.

A Study of the Relation of the Structure of Mercaptobenzothiazole and Its Derivatives to Their Value as Accelerators of Vulcanization. The preparation of mercaptobenzothiazole derivatives by the methods reported in a previous paper has been extended to include several new mercaptothiazoles not previously described. Other compounds having a similar structure have been prepared and their curing power compared with that of mercaptobenzothiazole. In this way the particular grouping responsible for the activity of mercaptobenzothiazole as an accelerator has been identified. The effect of substituents in the benzene nucleus of mercaptobenzothiazole upon its activity as an accelerator has also been studied.—L. B. Sebrell and C. E. Boord.

Reactions of Accelerators During Vulcanization. V. Dithiocarbamates and Thiuram Disulphides. The metallic dithiocarbamates are true accelerators of vulcanization. Metallic oxides are necessary to prevent the decomposition of the metallic salts by hydrogen sulphide or to reform them after decomposition. Hydrogen sulphide changes thiuram disulphides to dithiocarbamates and decomposes the metallic salts. Ammonia increases the curing power of both thiurams and zinc dithiocarbamates. These views are supported by chemical data obtained in the laboratory in the absence of rubber.—C. W. Bedford and Harold Gray.

Rubber Softeners. The action of rubber softeners on rubber itself has received very scant attention from rubber chemists. The writers, in an effort to find out this action, heated vulcanized rubber in each of a large number of softeners until total disintegration ensued. The comparative rate of disintegration was also observed by means of a test in which the swelling of the rubber in the softeners was measured. This method was checked roughly. Sulphur, accelerators, and both together, were added successively to the softeners to find out their effect on the action, with the results that in each case there was an increase in the rate of solvation. The state of cure was also found to have an effect on the results, as the rate of solvation was found to be inversely proportional to the cure. Mixtures of softeners were found to have, in many cases, the average properties of their components. From these and compounding results, the writers are of opinion that a definite relation can be established between solvating action and the effects of softeners on the stress-strain curve.—P. M. Aultman and C. O. North.

Studies in Vulcanization: Mechanism of the Acceleration of Vulcanization of Zinc Ethyl Xanthogenate. The gaseous, liquid and solid decomposition products of zinc ethyl xanthogenate are shown to have no accelerating value. The activity of zinc ethyl xanthogenate as an accelerator is due to the unchanged molecule.—H. A. Winkelmann and Harold Gray.

The Resilient Energy and Abrasion Resistance of Vulcanized Rubber. A study of the effects of several common compounding pigments upon the abrasion resistance of vulcanized rubber showed that gas black gives the greatest resistance to abrasion, followed by light magnesium carbonate, china clay, zinc oxide, colloidal barium sulphate and lithopone, in the order named. There is found to be a relationship, but not a direct proportionality, between tensile strength and abrasion resistance, for rubber compounded with reinforcing pigments. Resilient energy gives an approximate index of abrasion resistance with gas black, magnesium carbonate, china clay and zinc oxide, but it is not a measure of abrasion resistance with colloidal barium sulphate or lithopone. The data appear to show that hardness (or rigidity) is also a factor in resistance to abrasive wear. The product of resilient energy and hardness is suggested as an index of toughness. Some principles are suggested which may be of value in compounding rubber to obtain high resistance to abrasion, including the use of high grade accelerated mixings and combinations of reinforcing pigments in such proportions by volume as to give proper rigidity combined with high resilient energy. Combinations of gas black and magnesium carbonate in suitable proportions are found to give high resistance to abrasion, high resilient energy and considerable hardness and rigidity.—H. W. Greider, Mellon Institute.

LONDON EXPORTS TO UNITED STATES INCREASING

According to *Commerce Reports*, the value of rubber exported from London to the United States during the first six months of 1922 totaled £1,037,626, as compared with only £435,213 for the corresponding period in 1921. Exports of all commodities from this source represent a considerably greater value than those of a year ago.

National Exposition of Chemical Industries

The Eighth National Exposition of Chemical Industries was held in the Grand Central Palace, New York, N. Y., September 11 to 16, 1922. The exhibitors numbered nearly 400 and their exhibits covered essentially the entire range of modern chemical industry. While the exhibition lacked the spectacular, and for that reason did not appeal as strongly as in other years to the general public, the exhibits were all high class, practical and of great interest to manufacturers, chemists and engineers. Many exhibitors reported great interest and good business as a result of their demonstrations and displays. The week's program was marked by daily sessions in the auditorium, featuring many interesting addresses, technical society meetings and motion pictures of industrial operations.

Among the many exhibits of interest to rubber manufacturers were the following:

Allis-Chalmers Manufacturing Co., Milwaukee, Wisconsin. Dust collecting systems, rubber-lined centrifugal pumps, motors for rubber mill service, etc.

American Hard Rubber Co., New York, N. Y. Hard rubber piping, pumps and other hard rubber equipment adapted to corrosion problems and electrical work.

Joseph Baker Sons & Perkins Co., New York, N. Y. Exhibit of the Universal kneading and mixing machine for mixing plastic masses in various manufacturing industries, including rubber.

Barber Asphalt Co., The, Philadelphia, Pennsylvania. Asphalt products, Genasco mineral rubber, and rubber reclaiming oil.

Benzine Condensation Co., Inc., New York, N. Y. Apparatus and system for recovery of benzine in rubber making and other industries using recoverable volatile solvents.

The Bristol Co., Waterbury, Connecticut. Display of indicating and recording instruments for all purposes. Temperature controllers and long distance electric transmitting and recording system for pressure, liquid level, temperature, mechanical motion, etc.

Buffalo Foundry & Machine Co., Buffalo, N. Y. Special castings and apparatus for chemical manufacturing processes, evaporating, vacuum drying, pumping, distillation, etc.

Carrier Engineering Corporation, Newark, New Jersey. The Carrier processing cabinet, a complete unit air conditioning installation with its own processing chamber.

Cooper Hewitt Electric Co., Hoboken, New Jersey. Uviare lamps and test cabinet for testing fastness of colors to light.

J. H. Day Co., The, Cincinnati, Ohio. Special milling, mixing and sifting machinery for the manufacture of rubber, paint, ink, and chocolate.

J. P. Devine Co., Buffalo, N. Y. Photographs of installations of Devine apparatus for the rubber and chemical manufacturing industries. A corps of expert chemical engineers imparted valuable information and suggestions on vacuum drying, evaporating and impregnating apparatus, pumps and condensers.

Hunter Dry Kiln Co., Indianapolis, Indiana. A model was shown of the Hunter automatically controlled dry kiln for crude or reclaimed rubber, compounding ingredients or other material requiring drying under controlled conditions.

Innis, Speiden & Co., New York, N. Y. Display of industrial chemicals and products used in the rubber industry.

Mineral Point Zinc Co., New York, N. Y. Zinc products for industrial purposes including zinc oxide.

Morse Chain Co., Ithaca, N. Y. Morse chain drives with full line of samples including a 100 h.p. chain drive in operation with rotoscope attached to show the rocker-joint action as the chain enters and leaves the sprocket.

National Aniline & Chemical Co., Inc., New York, N. Y. Intermediates, dyes and chemicals of coal tar origin in great variety, including accelerators of vulcanization for use in the rubber manufacturing industry.

New Jersey Zinc Co., The, New York, N. Y. Products made of zinc for a wide variety of structural and industrial uses. Zinc oxide and albalith for paint and rubber goods manufacture were featured. An interesting "flow sheet" was exhibited, appropriately illustrated with specimens showing the derivation of zinc products from the ore.

New York Rubber Co., New York, N. Y. This company in conjunction with the Clapp Products Co., Boston, Massachusetts, exhibited fabric, tires, and belting that had been toron-treated for prevention of mildew and for improvement of structural strength and endurance. The belts displayed were in motion under conditions demonstrating their resistance to moisture and caustic alkali as met with by belting in paper mill service.

Roessler & Hasslacher Chemical Co., The, New York, N. Y. Chemicals and vulcanization accelerators for the rubber trade, including hexamethylene tetramine, aldehyde ammonia, formaldehyde aniline, thiocarbanilide, and diphenylguanadine; also golden crimson and vermilion sulphurets of antimony.

Salmon Falls Manufacturing Co., Boston, Massachusetts. Tire fabrics, carded and combed.

Schaeffer & Budenberg Manufacturing Co., Brooklyn, N. Y. Indicating and recording pressure gages and industrial thermometers, temperature regulators, hand and stationary tachometers, counters, etc.

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania. AC industrial motors, specially impregnated coils, starters, control and safety switches, industrial heating furnaces and heating elements, lighting fixtures, small turbine drive, and fractional horsepower motors.

Whitall Tatum Co., New York, N. Y. Druggists' rubber sundries, molded goods and glassware, products of highest quality manufactured in its own rubber plant and glass factories.

Yarnall-Waring Co., Philadelphia, Pennsylvania. Devices for modern power plants for increasing efficiency, eliminating motion and power. Among these appliances are specially constructed blowoff valves, boiler skimmer, V-Notchmeter for measuring liquids, hydraulic valves, pipe joint clamps, adjustable spray heads, etc.

METRO-NITE

Metro-Nite is a new refined natural mineral product composed of calcium carbonate and carbonates and silicates of magnesia. It is used in the paint industry as an extender for mixed and paste paints, and enamels. The claim is made that Metro-Nite is the whitest inert pigment known and that as refined it runs absolutely even in cleanness, color, and fineness.

Its composition is shown in the following analysis:

Calcium carbonate	44.62
Magnesium carbonate	35.65
Calcium and magnesium silicate	19.58
Moisture	0.15

JAVA'S IMPORTATION OF MOTOR TIRES

According to *Commerce Reports*, Java imported, from all sources, during the first 11 months of last year, 209,000 motor tires. Of these, France supplied 67,000, Japan 64,000, while the United States stood third, at 31,000. Great Britain had contributed only 5,000, and Australia 3,300.

What the Rubber Chemists Are Doing

The Coefficient of Vulcanization of Rubber[1]

THE experiments described by the authors were carried out at the Imperial Institute in the course of investigations connected with the Ceylon rubber research scheme, the object of which was to determine to what extent, if any, the percentage of sulphur combined with rubber at the standard cure adopted, is dependent upon the nature and amount of the usual accessory substances present in raw rubber.

Twenty-four samples of rubber were selected for examination. They consisted of six samples of crêpe rubber and six samples of sheet rubber prepared on an estate in Ceylon from the latex of a group of trees approximately 10 years old, and also of six samples of sheet rubber and six samples of crêpe rubber prepared on the same estate from another group of trees approximately 20 years old. From each lot of latex were prepared one sample of sheet rubber and one sample of crêpe rubber.

The standard cure selected was that which gave a stress-strain curve which passed through 830 per cent elongation under a load of 1.36 kg. per sq. mm. In the majority of cases the standard cure was calculated from the position of the stress-strain curve at a cure two to three minutes above or below the standard cure. This could be done with accuracy, since the alteration in the position of the stress-strain curve with time of cure was determined for each sample.

The average vulcanization coefficients are collected below:

	Series I. trees (about 10 years old)	Series II. trees (about 20 years old)
Sheet	5.47 ± 0.19	5.38 ± 0.10
Crêpe	5.20 ± 0.16	5.00 ± 0.07

The vulcanization coefficient of crêpe at the standard cure is distinctly less than that of sheet. The vulcanization coefficient of rubber from the older trees is slightly less than that of rubber from the younger trees and the results are distinctly more uniform.

It is an interesting and possibly significant fact that as the average time of cure increases, so the average vulcanization coefficient decreases.

	Series I. trees		Series II. trees	
Form	Time of cure	Vulcanization coefficient	Time of cure	Vulcanization coefficient
Sheet	61	5.47	72	5.38
Crêpe	107	5.20	126	5.00

It should be noticed that there is no relation between the time of cure and the vulcanization coefficient of individual rubbers. The relation is only found to exist when average results of a series of experiments are taken. It is possible therefore that the vulcanization coefficient at the standard cure is dependent upon some factor indefinitely associated with the accelerator present in the dry rubber.

The average chemical composition of the rubbers was:

	Series I. trees (about 10 years old)				Series II. trees (about 20 years old)			
	Resin	Protein	Ash	Caoutchouc	Resin	Protein	Ash	Caoutchouc
Sheet	1.98	2.27	0.28	95.47	1.73	2.09	0.28	95.90
Crêpe	2.86	2.25	0.28	94.61	2.65	2.11	0.25	94.99

Influence of Accessory Substances

Following up the presumption that some of the accessory substances in raw rubber increase the amount of combined sulphur at the standard cure, the question arises as to which are responsible.[2] With a view to finding which of the accessory substances are chiefly responsible for variations in the vulcanization coefficient, attempts were made to correlate the vulcanization coefficient of each sample of rubber with the amounts present of ash, "resin" (acetone-soluble substances), and protein compounds, and also with the time of vulcanization. The latter was taken as a measure of the amount of natural vulcanization accelerators present.

Only in the case of the "resins" could a distinct relation be found between the amount of this present in each rubber and the corresponding vulcanization coefficient. Attention has already been called in this paper to the relation between the average time of vulcanization and the average vulcanization coefficient, and it has been pointed out that this relation does not hold for individual rubbers. In the case of the resins, with one or two exceptions, there is a relation between the amount of the resin of individual rubbers and the vulcanization coefficients at the standard cure.

Slab Rubber

Numerous investigations at the Imperial Institute have shown that slab rubber and also rubbers which have been machined, and then kept in a wet state, usually have a higher amount of resin and a lower amount of protein than has sheet or crêpe; moreover, they generally vulcanize quickly.[3]

It is evident from the above experiments that the resin constituents of slab rubber are responsible for its quick curing properties. This is confirmed by the fact that the acetone-extracted sample of slab required 90 minutes to vulcanize. It seems probable that part of the protein portion of raw rubber during the process of maturing is rendered soluble in acetone and this acts as a strong accelerator.

Influence of Resin

The influence of the resin constituents of rubber on the coefficient of vulcanization at the standard cure raises the query as to whether the estimation of the correct time of cure by the determination of combined sulphur gives results similar to those obtained by physical methods. The average vulcanization coefficient for the whole of the 24 samples described in the first part of this paper is 5.26. Assuming that a rubber which has been cured to a coefficient of 5.25 is correctly cured for the purpose of these experiments, the time of cure of each sample can be calculated and the results compared with those obtained by physical methods. The results are in agreement with those of other workers and indicate that the chemical method of determining the time of cure does not give results materially different from the physical method.[4] Rubbers from the same latex and prepared in the same way differ in cure roughly by the same amount whether their time of cure is estimated physically or chemically. There is not the same agreement between the physical and chemical methods of estimating the time of cure when rubbers of different form, such as crêpe and sheet, are concerned. These two types of rubber, however, differ in time of cure by an amount so large that these discrepancies are of little importance.

We may definitely conclude that the relative times of cure of rubber-sulphur (90:10) mixes are approximately the same whether we adopt the chemical or physical method of determining the time of cure.

Conclusions

The amount of combined sulphur at the standard cure depends upon the way in which the rubber is prepared, upon the trees from which the latex is obtained, and also to a less extent upon unexplained variations in the finished rubber from time to time. In the samples tested the maximum variation did not reach 1 per cent of combined sulphur.

For a series of rubbers, as the average time of cure increases so

[1] Abstract of paper by G. Martin and F. L. Elliott, The Journal of the Society of Chemical Industry, July 15, 1922, 226T-228T.

[2] De Vries, Estate Rubber, 1920.

[3] Bulletin of the Imperial Institute, 1918, 16, 435.

[4] Eaton, Agricultural Bulletin, Federated Malay States, No. 27; De Vries, Estate Rubber, 1920.

the average amount of combined sulphur at the standard cure decreases.

The amount of combined sulphur at the standard cure for rubber of the same form, and from the same trees, varies approximately as the amount of resin constituents of the rubber varies.

The resin of crêpe rubber has little influence on the rate of combination of rubber with sulphur. The resin of sheet rubber acts as a mild accelerator, while the resin of slab rubber contains a strong accelerator. The resins of slab and sheet rubber increase the vulcanization coefficient of crêpe rubber at the standard cure more than does the resin of crêpe rubber.

Whether the time of cure of the rubber-sulphur mix (90:10) is estimated by chemical or physical means, the results are approximately the same, as long as similar forms of rubber are compared. The differences are larger when dissimilar forms such as sheet and crêpe are compared.

Composition of Golden Sulphide of Antimony[1]

By A. Short and F. H. Sharpe

The analytical study of golden sulphide of antimony, generally called antimony pentasulphide, and the question of the composition of the commercial product, have been the subject of much investigation. It is generally assumed that it is substantially composed of antimony pentasulphide. It is associated in most cases with other materials such as coprecipitated sulphur and also coprecipitated calcium sulphate. It has also been stated that the solvents which are generally used in determining the free sulphur content, that is, carbon bisulphide, decompose the pentasulphide, leaving more or less antimony trisulphide in the residue.

A general resumé on golden sulphide has already been given in a recent paper by Luff and Porritt[2] in which this question is fully discussed. Otto[3] as far back as 1863 stated that the pentasulphide is decomposed on extracting it with carbon bisulphide and the residue corresponds practically to Sb_2S_4. The full significance of this statement seems to have been overlooked, for modern text books rarely mention the tetrasulphide. Kirchhof, however, concludes that antimony pentasulphide does not exist, and that the golden sulphide (which in its purest form yields 8 per cent of sulphur to carbon bisulphide) consists mainly of the tetrasulphide, Sb_2S_4, with variable quantities of the trisulphide and free sulphur. He regards Sb_2S_4 as antimony thioantimonate, $Sb(SbS_4)$.

We agree with Kirchhof that commercial golden sulphide is not antimony pentasulphide but tetrasulphide and that this is a stable compound not decomposed by carbon bisulphide. Direct evidence that golden sulphide of antimony is decomposed by these solvents is difficult to obtain, as also is direct evidence to the contrary. It was therefore mainly on the interpretation of a large number of analyses that we arrived at our conclusions.

The reaction by which golden sulphide of antimony is prepared by decomposing a solution of Schlippe's salt with dilute acid is generally looked upon as being

$$2Na_3SbS_4+6HCl=6NaCl+3H_2S+Sb_2S_5.$$

It is well known that the product prepared as above yields a considerable amount of free sulphur to carbon bisulphide, hence the theory that this solvent partially decomposes the pentasulphide with the formation of free sulphur and a corresponding amount of trisulphide. If this be the case it is curious that the decomposition is only partial and that the residue corresponds to tetrasulphide and not to trisulphide, as is generally supposed.

Extraction with carbon bisulphide is almost universally used by rubber manufacturers to determine the amount of free sulphur available for vulcanizing, and vulcanizing results confirm the practical utility of the method. It is not necessary to use what may be termed the "true" golden sulphide, as prepared from Schlippe's salt. Precipitated trisulphide, and also oxysulphide can be used in the vulcanizing process with success; for instance, crimson sulphide, made in a totally different manner, is either trisulphide or oxysulphide or a mixture of these, and the yellow trisulphide is often used. In the case of these substances the carbon bisulphide method will obviously give the correct amount of free sulphur, due regard being paid to the question of "insoluble" sulphur.

During the last few years the authors have had the opportunity of examining for commercial purposes many samples of golden sulphide of antimony from various sources. The antimony content of the dried sample was carefully determined by the bromate method, the free sulphur by extraction in a Soxhlet tube with pure carbon bisulphide, and the calcium sulphate was separated as oxalate and determined volumetrically.

It was found in almost every case that if the antimony content was calculated as tetrasulphide, Sb_2S_4, the sum of the main constituents, namely, antimony sulphide expressed as tetrasulphide, free sulphur, and calcium sulphate ($CaSO_4,2H_2O$), totaled practically 100 per cent. Other impurities such as free acid and foreign matter were present in negligible quantities. The only exceptions were samples which were obviously composed of trisulphide, some of which contained practically no free sulphur.

The following examples illustrate this:

	Source	Sb %	Sb_2S_4 calc. from Sb %	Free S %	$CaSO_4$ $2H_2O$ %	Total %
1	English	23.2	35.57	16.6	47.6	99.77
2	English	23.0	35.2	15.2	49.3	99.7
3	English	29.9	45.8	6.0	48.0	99.8
4	English	35.7	54.7	2.3	42.8	99.8
5	French	46.9	71.9	20.8	7.0	99.7
6	French	32.6	50.0	20.2	29.6	99.8
7	French	21.6	33.1	18.1	48.6	99.8
8	U. S. A.	33.6	51.5	15.0	33.2	99.7
9	Unknown	58.6	89.85	5.0	5.2	100.05
10	German (?)	21.0	32.2	17.4	50.2	99.8
11	German (?)	24.9	38.2	17.6	44.0	99.8
12	German (?)	24.2	37.1	61.7	1.0	99.8

We conclude, therefore, that in the absence of real evidence that a comparatively inert substance such as carbon bisulphide brings about decomposition of pentasulphide, it is more probable that the decomposition of Schlippe's salt with dilute acids results in the production of a mixture of antimony tetrasulphide and sulphur according to the following equation:—

$$2Na_3SbS_4+6HCl=6NaCl+3H_2S+Sb_2S_4+S.$$

Antimony tetrasulphide when properly prepared appears to be stable at the temperature of vulcanization and only decomposes, with blackening and conversion into the black trisulphide and sulphur, at a temperature considerably above that used in the vulcanizing process. All samples of "true" golden sulphide blacken in this way at 250 degrees C. with complete decomposition but some inferior samples darken at a lower temperature with partial decomposition. There are several factors which may cause the latter. Yellow amorphous trisulphide on heating is converted into the black crystalline variety.

If Van Rossem and Dekker's figures[4] are recalculated, on the assumption that tetrasulphide is present and not pentasulphide, a new indirect figure is obtained for free sulphur which in every case except one agrees very closely with the direct free sulphur determination by carbon bisulphide, confirming the view set forth above.

Summary

The results of the investigation indicate that while the existence of antimony pentasulphide is not precluded, commercial golden sulphide of antimony probably contains no higher sulphide than tetrasulphide and that there is strong evidence of the existence of the latter, which may be looked upon either as the antimony salt of thioantimonic acid, or as the compound Sb_2S_5,Sb_2S_6. They also indicate that the sulphur extractable by carbon bisulphide is available for vulcanization.

[1] Journal of the Society of Chemical Industry, April 29, 1922.
[2] Journal of the Society of Chemical Industry, December 15, 1921, page 275T. THE INDIA RUBBER WORLD, February 1, 1922, page 356.
[3] Anorganische Chemie, Volume III, page 689.
[4] Journal of the Society of Chemical Industry, October 30, 1920.

Electrical Records of Rubber Stress-Strain Data

How Charts Are Made—Mechanical and Electrical Features of the Apparatus—Making the Test Records

By C. J. Burkley[1]

ALL testing laboratories welcome the advent of those devices which reduce the labor and relieve the monotony of routine testing. In the following article a device is described affording a means of efficiently recording stress-strain data of rubber stocks where only one operator is necessary. Simplicity and low installation cost are other advantages offered. Fig. 1 shows an actual installation. This device has already been successfully operated for 18 months.

At the present time two operators are required to measure stress-strain data on the well known rubber testers. The first operator runs the testing machine and signals the observer at various elongations of the specimen under test. The observer is so stationed to read the instantaneous load on the dial of the machine and record it on the data sheet.

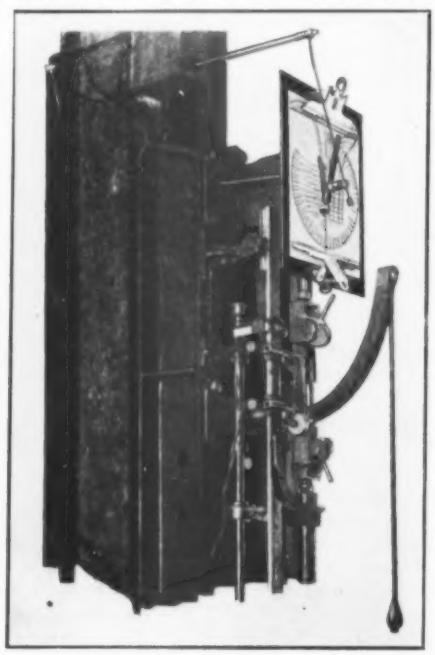


Fig. 1. Installation for Recording Stress-Strain Data

The device referred to eliminates the work of the observer. A paper chart with the same divisional markings replaces the usual load dial. The operator making the test in signaling causes a high potential current to pass from the indicator arm to the steel plate supporting the chart and thereby punctures a hole in the chart at that instantaneous load recorded at time of signal. At the end of the test the chart is removed and the actual record of the load readings at definite elongations is available for final calculations. Suitable columns are provided on the chart for recording the final data.

Making the Charts

One of the most important points in constructing this device is the making of accurate charts. This is accomplished by making a tracing from the divisional load graduations on the dial of the machine, and establishing a center line which passes diametrically through the zero-load point on the dial. An "X" is marked on this line at a point 4⅜ inches above the center of the circle on the chart. This line and marking are used in adjusting the charts when they are applied to the machine. Another line disposed radially on the chart and to the left of the center line is used as a guide in dieing out a slot 4 inches by 12/16-inch, as it is necessary in applying this chart to slip the indicating arm through the slot before finally adjusting the chart in position. An electroplate of exact size is made from this tracing and serves as the basis for printing any number of charts. The chart is 8 by 11 inches, and is shown in Fig. 2.

Mechanical Features

In the following description of the mechanical features of this device reference is made to Fig. 3 showing working drawings.

A steel plate (J) somewhat larger than the charts is installed in place of the regular dial of the testing machine. This plate is marked with a vertical center line which passes through the center of the shaft operating the indicating arm, and the point of no load register on the plate. Spring clamps (KK) with rubber surfaced edges are fastened at the top and bottom of the plate. These clamps hold the chart in place. The upper clamp is so mounted that its edge intersects the center line of the plate at a point 4⅜ inches above the center of the indicating arm shaft. At those two points where the vertical center line on the plate intersects the edges of the clamps, a small V-shaped notch (RR) is cut into the edge of each clamp. This should be done carefully, because in applying the charts to the machine it is absolutely essential to have the vertical center line of the chart coincide with the notches in the clamps. The exact position is secured by having the "X" mark on the center line of the chart coincide exactly with the notch in the center of the upper clamp.

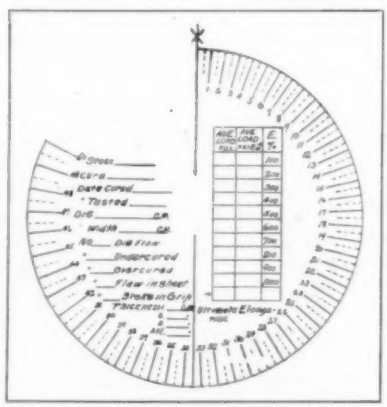


Fig. 2. Recording Chart

Electrical Connections

A pointer arm (I) of ebonite or other insulating material is installed in place of the regular indicating arm. Three small machine screws (CCC) pointed at one end are screwed through the pointer arm in such a manner that, when finally adjusted, each one makes a ⅛-inch spark gap with the steel plate.

Since a conductor from the high potential side of the coil (A) cannot be directly connected to the spark points (CCC) on the ebonite arm, because the arm in revolving would cause the wire to tangle, a suitable insulating stub (H) provided with a metal transfer pin is suitably fastened to the top of the screw attaching the ebonite arm to the shaft. A rigid high tension conductor (D) about ⅛-inch in diameter is hung from (P) and makes an electrical contact against the transfer pin (F). In this way, during a test, the conductor (D) is free to commutate around the transfer pin (F).

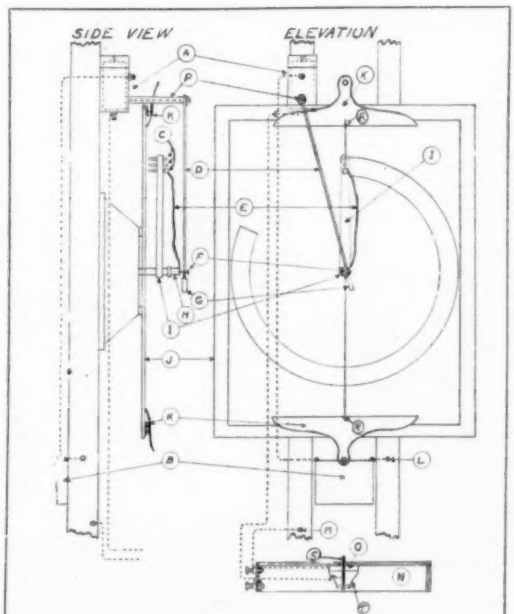
A piece of small gage spring wire (not shown on sketch) is wound around the rigid arm (P) and hooked around the conduc-

[1] Development Department, The Goodyear Tire & Rubber Co., Akron, Ohio.

tor (D). This serves two purposes: It insures a good contact of the conductor (D) against the transfer pin (F) during a test and throws the conductor well out of the way while inserting a chart. (G) is an insulating knob for use in handling (D). The transfer pin (F) has a flexible wire (E) soldered to it at that point where the pin emerges from the rubber stub (H). On the other end of the flexible wire (E) a short metal sleeve is fastened. The purpose of this sleeve is to make electrical contact with the exposed ends of the screws (CCC). The internal diameter of this sleeve is such that it can be readily slipped over the exposed ends of the screws. By changing the sleeve from one screw to another, three separate and distinct records of stress-strain data may be had on the same chart.

The Foot Switch

The foot switch (N) is constructed in the following manner. It is built in a wooden box which is large enough to permit the operator to stand comfortably upon it. Upon the top and in the center of this box a hole 2 inches in diameter is drilled. The switch mechanism consists of three parts, an iron rod (S) about 5 inches long by ⅛-inch diameter, a disk of rubber (O) 3 inches in diameter by ½-inch thick, and a metal case (T). The iron rod is forced through a hole in the center of the rubber disk. The metal case is in the form of a truncated cone with both ends open. When mounted with the other parts, the rubber disk fits into the larger end of the metal case and the iron rod extends through the other end. This switch is suitably mounted underneath and concentric with the 2-inch hole in the top of the wooden box. The metal case is fastened to the box with small metal tabs. In connecting up this switch one wire is attached to the metal case (T). The other wire, attached to the iron rod (S), passes through a hole cut into the side of the case. This can be readily grasped by referring to Fig. 3. In operating this switch horizontal pressure from any direction on (S) where it extends above the top of the box will cause it to make electrical contact at some point along the inside of the metal case. The rubber disk serves the purpose of spring and insulation. The general wiring diagram for the whole installation is shown by dotted lines on Fig. 3.



(A) Induction coil capable of ¾ spark (Ford ignition coil will answer). (B) Six-volt storage battery. (C) Three spark points set in ebonite arm (I). (D) Rigid conductor about ⅛-inch diameter. (E) Flexible wire with metal sleeve on end, carrying current from transfer pin (F) to spark points (C). (F) Metal transfer pin inserted in high tension insulator (H) (hard rubber). (G) Insulating handle on end of (D). (H) Hard rubber insulator fastened to end of ebonite arm pinion. (I) Ebonite pointer arm carrying the three spark points (C). (J) Steel plate chartholder. (K) Clips at top and bottom of chart plate to hold chart in position. (L) Battery ground. (M) Ground for switch. (O) Flexible rubber disk. (P) Rigid conductor attached to spark coil (A) and supporting conductor (D). (R) Notches in clamps (KK) for use in applying charts. (S) Iron rod 5 inches by ⅛-inch, part of switch mechanism. (T) Metal case for switch.

Fig. 3. Working Drawing of Installation

Method of Operation

Summarizing, the high tension current flows from the rigid arm (P) through the conductor (D) to the transfer pin (F) thence through the flexible wire (E) to the particular spark point (C) upon which the sleeve is placed. The spark discharges from the spark point (C) to the metal plate (J) which has been grounded on the low tension side of the spark coil (A). In discharging, the spark burns a hole in the chart which is between the metal plate (J) and the spark point (C).

The electrical circuit is closed by means of the foot switch previously described which leaves the hands free for operation of the machine.

High Pressure Packing[1]

Ordinary sheet rubber packing is unsuited as jointing for withstanding the high pressures and heat encountered in present engineering practice. To meet these conditions special packings are necessary. These are made from compositions consisting essentially of a felted mass of fibers held together by a little rubber, mineral fillings being added according to quality.

Asbestos is the most suitable fiber to use because of its resistance to high heat and fire. Besides this quality asbestos fiber itself possesses great tensile strength, although asbestos yarn is not very strong because of the lack of cohesion between the individual fibers. Type and length of staple of the fiber are important. The strength of the sheeting depends on the perfect felting of the fiber for which the long staple is best. Other fibers than asbestos give an inferior product of little service value.

Manufacture

The rubber for the mixing is first masticated and then reduced to a solution in solvent naphtha. To this are next added the mineral ingredients in a cement mixer to form a uniform paste. Carded asbestos fiber is then introduced and the whole well mixed.

Formulas

The general principle of mixing is to use from 40 to 50 per cent of asbestos fiber, about 10 per cent of rubber, and the remainder of various fillers and coloring matters. The usual fillers are magnesia, zinc oxide, barytes, lithopone, etc.

For coloring purposes carbon black, red oxide, and ochre are used. About three or four per cent of sulphur is added for vulcanization. The quantity of solvent is determined by actual trial. Sufficient should be used to make the mixture freely plastic and serious loss is avoidable by employing a solvent recovery process.

Making the Sheets

After thorough mixing requiring about an hour, the dough is sheeted thin on water-cooled rolls and the solvent evaporated in a vacuum chamber. The dried sheets are pressed and plated at 500 pounds per square inch between sheets of zinc in a hydraulic press.

The packing is then trimmed to standard sizes and calendered to give it a glaze finish. Sheets of greater strength are made by doubling together thin single sheets that have been solutioned; then passing them through heated calender rolls of large diameter to unite and consolidate them.

[1] "Asbestos High Pressure Jointing." The India-Rubber Journal, July 8, 1922, page 6.

READY FOR MAILING. "PNEUMATIC TIRES," BY HENRY C. PEARSON. An encyclopedia of tire manufacture, repair, rebuilding, machinery and processes.

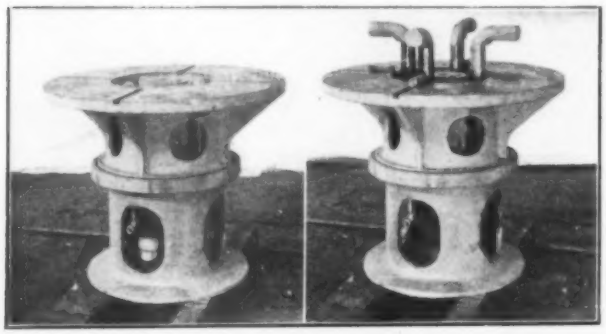
New Machines and Appliances

Combination Rimming Press and Tire Stand

A COMBINATION rimming press and tire stand is here shown. In their lowest position, the clamping hooks are below the top surface of the table to allow a perfectly flush surface when used as a tire stand.

The combined downward effort of the clamping hooks is ten tons when operated with 1,500 pounds' pressure. The machine is equipped with a constant pressure lifting cylinder which will hold the clamping hooks in the highest position.

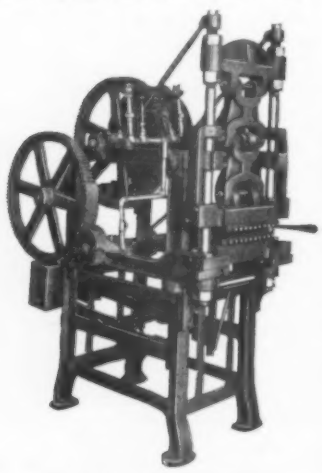
The maximum distance between the under side of the clamping hooks and the table is 6¼ inches and the extreme distance over the clamping hooks is two feet four inches which will take care of the largest size rim. The hooks are adjustable and can be swung in all directions to allow pressure to be applied at various points of the circumference of the rim.—Southwark Foundry & Machine Co., Philadelphia, Pennsylvania.



Rimming Press and Tire Stand

Composition Molding Machine

A semi-automatic machine for both hot and cold composition molding is here illustrated. The machine is a compound-gear, cam-driven press. It has a rapid formed stroke until the upward dies are within a short distance of closing, from which point the motion becomes very slow until the dies are closed. This permits the stock to flow freely and fill the dies.



Terkelsen Molding Press

The power is consumed for only an instant while the pressure is applied. The machines are capable of taking dies up to 16 inches long by 6 inches wide. The capacity varies according to the product. Four horsepower is required for operation.

A distinctive feature of this press is that the molds are not handled by the operator and the output of product is several times greater than in the case of a hydraulic press.—Terkelsen Machine Co., Boston, Massachusetts.

Circular Inner Tube Mandrel

The circular form of mandrel is rapidly superseding the old straight form in the manufacture of inner tubes. It is, in fact, essential in making the giant tubes which must fit the casing and be free of buckling and contraction of the inner circumference. Such mandrels are usually sherardized or zinc coated and highly polished.

N. H. S. Co.'s Circular Mandrel

One of the popular makes of circular mandrels is shown in the accompanying illustration which also shows the insert plug and holding bar for handling the mandrel on the stand while mounting, wrapping and dismounting the inner tube.—The New Haven Sherardizing Co., New Haven, Connecticut.

Cord Tire Core and Chuck

The quick acting collapsible cord tire forming core and chuck seen in the illustrations is said to be the fastest and best constructed chuck now extant. It is interchangeable on tire building machine or tire building stand. In actual work the tire casing can be loosened, the core collapsed, tire removed and core reassembled in 45 seconds. One size chuck only is required and it can be used for all size cores from 28 by 3 to 37 by 5, inclusive. Removal of the wedge piece throws the core out of balance, causing the chuck to turn over on the machine so that the wedge open-

Collapsible Tire Core and Chuck

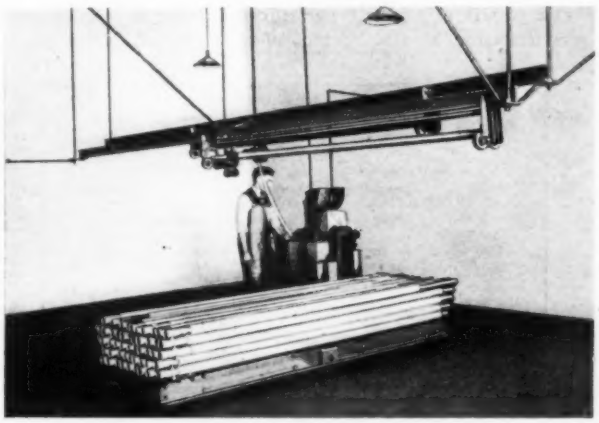
ing is at the top, thus automatically bringing it into correct position for breaking down the two sides of the core ring, which are hinged as shown in the illustration.

The manufacturer claims that eight finished cord tires per hour can be made by two operators using the Thropp tire making machine and one of these cores and chucks.—The John E. Thropp's Sons Co., Trenton, New Jersey.

Inner Tube Wrapping and Winding Machine

A view is here shown of a new machine designed to strip the cross wrappers from straight built inner tubes and rewind the wrappers through a water tank onto the bobbin for reuse—all in one operation.

The machine is supported from overhead with the exception of the rewinder and the floor left unencumbered with poles or wrappers. The moving parts of the machine are specially designed for ease of operation and thus permit the pull of the wrapper to



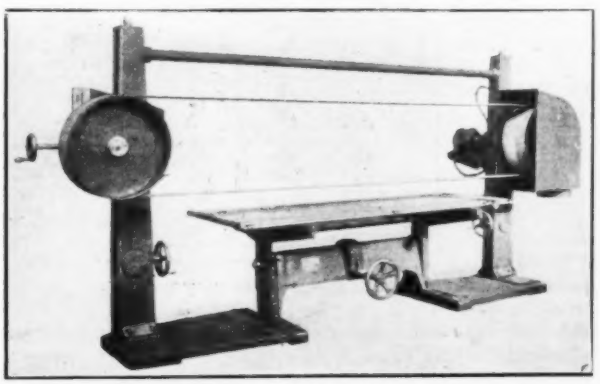
Winding Machine for Inner Tube Wrappers

move the pole up and down the track until the entire wrapper is removed.

A large saving in labor is said to be effected by the use of this machine, since one man is able to rewind the wrappings on 1800 tubes per day.—Utility Manufacturing Co., Cudahy, Wisconsin.

Belt Sander

A horizontal belt sander provided with a vertically adjustable table or bed has been designed for sanding and finishing all kinds



Self-Contained Belt Sander

of straight, flat and irregular surfaces in wood, metal, rubber tiling, hard rubber and allied plastics.

The principal parts of the machine, as seen in the illustration, are the power stand, idler stand, and table. The two stands are connected with a rigid top stay. The sand belt pulleys run in ball bearings. Individual vertical adjustment on gibbed graduated ways is provided, the adjustment being by means of hand-wheel bevel gears and screw.

The pulleys are rubber-faced and run at 600 r.p.m. A reversible switch permits running the belt in either direction. Belts about 31 feet long and any width up to ten inches may be used. The machine is well guarded and convenient, and quick operation is a feature.—Oliver Machinery Co., Grand Rapids, Michigan.

Electric Sifter and Strainer

An electric sifter for all kinds of dry materials is pictured in Fig. 1 and the same machine as a strainer and mixer for liquids and semi-liquids of all kinds is shown in Fig. 2.

The light weight of the sifter permits it to be hung from any convenient support at any desired height. It is operated by a vertical direct connected motor in which the armature and shaft remain stationary and the field and housing revolve at high speed, supplying the extremely rapid vibratory motion which is necessary.

The sifter is converted into a strainer by partly closing the top with a special cover having an opening just large enough to admit the substance to be strained and yet prevent the liquids from splashing.

The peculiar vibrating motion, it is said, makes a better mixture and does more sifting or straining, as the materials are not

Fig. 1. Wallace Sifter

Fig. 2. Wallace Strainer

forced, but are rapidly shaken through the screen.—J. D. Wallace & Co., 1401 West Jackson Boulevard, Chicago, Illinois.

Compact Tire Repair Vulcanizer

This is a very compact and heavily built vulcanizer, tested to 300 pounds cold water pressure and equipped with fusible plugs. The mold cavities are made oversize to provide for curing both cord and fabric tires. The cavities have a ground finish to insure easy flow of stock and prevent liability of sticking. The "Twin" 3½-inch vulcanizer is equipped with 8 sets of aluminum bead molds, clincher and straightside for each mold.

In view of the fact that nearly two-thirds of the tires brought in for repair are 3½-inch, this vulcanizer is built to accommodate two tires of this size at the same time. On either side of the central or tire mold section are located at one end a steam-plate with screw clamps for curing patches on inner tubes, and at the other end a means for curing a local tire body or tread repair.—Dodge Manufacturing Co., Saint Paul, Minnesota.

Adjustable Truck Tire Repair Mold

An adjustable single cavity mold is here shown in which any repair or retread can be cured upon a five to a nine-inch truck tire. This is accomplished by means of a split mold with spacers and reducing shells. The mold not only saves fuel and space but also lessens the original cost of equipment necessary to handle all classes of truck tires.

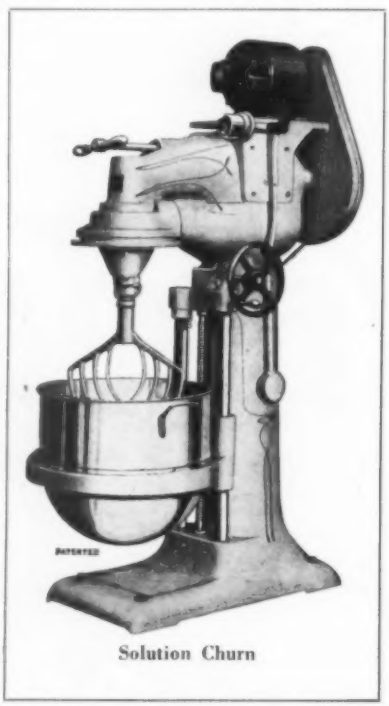
Mold for Truck Tires

This invention, therefore, affords the ordinary vulcanizer, at a small cost, the facility to handle all classes of repair work on truck tires within the range of five to nine inches, inclusive, and thereby gain the more profitable repair work, which is greater on truck than on passenger tire sizes.—The Western Rubber Mold Co., 321 North Crawford Avenue, Chicago, Illinois.

Three-Speed Cement Mixer

Mixing rubber cements, dopes and solutions for laboratory and rubber manufacturing purposes is often accomplished at great disadvantage where a suitable mixer is not provided.

The machine represented in the illustration is built as a three-speed mixer for continuous heavy service. It can be provided with a variety of attachments for special mixing purposes.



Solution Churn

As a laboratory mixer and for the manufacture of cements, etc., on a small manufacturing scale, the machine would doubtless give good service owing to its substantial construction and range of speeds.—Read Machinery Co., York, Pennsylvania.

Machinery Patents

Rubber Coating Cords Direct from Latex

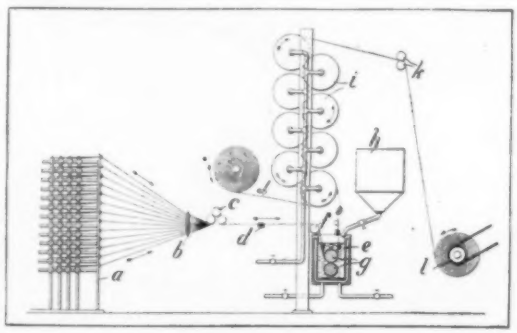
The diagram shows a machine for rubberizing cord fabric for tires, hose and other articles, direct from rubber latex.

The cords pass from a creel *a* through a thread board *b*, from which they pass between power-driven tension rollers *c* and an expansion comb *d*, which serves to arrange the cords in parallel alinement. The cords then pass over an idler *f* and just before entering the tank they pass between a pair of squeeze rolls *g*.

Tank *e* receives its supply of latex from tank *h*. On the tank *e* are mounted an expansion comb, an idler roller, and a double doctor blade, in succession. The latter scrapes off the excess of latex which falls back into the tank. Above the latex tank *e* is a series of steam-heated dry cans *i* over which the rubberized sheet of cords passes with a thin liner sheet of smooth cloth *j* next to the cans to prevent the sticking of the cords to the cans. From the dry cans the rubber coated material passes through idlers *k* to the wind-up roll *l*.

The latex employed for coating cords is preferably of the type treated with ammonia for preservation, and of an undiluted consistency containing 25 to 40 per cent of rubber. A more continuous distribution of rubber on the fiber is obtained the higher the rubber content of the latex employed.

One passage of cords through a bath of latex at ordinary temperatures causes an absorption of 20 to 25 per cent of dry rubber based on the cord weight.—Ernest Hopkinson, New York, N. Y. United States patent No. 1,424,020.

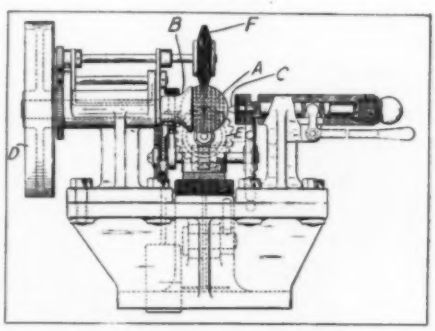


Latex Rubberizing Machine

Golf Ball Trimming Machine

The overflow resulting from the application of golf ball covers is removed by the machine which is shown in the illustration.

The ball *A* is held between a cup-shaped gripper *B* and a spring-pressed center *C*, rotated from a pulley *D*, and trimmed by a notched stationary cutting disk *E* and the rotary brush *F*. Mechanism is provided for guiding into proper relationship to the disk cutter the ball fin to be removed and the annular adjustment of the cutter is effected by a hand-knob and split clamping ring.



British Golf Ball Trimmer

In operation, the ball is rotated between the centers and the cutter is brought up to engage resiliently with the work by a hand-wheel, not seen in the figure. The rotation of the hand-wheel shaft brings the brush into engagement with the work to

finish the trimming operation.—A. E. White, London, England; The B. F. Goodrich Co., New York, N. Y. British patent No. 177,083.

Other Machinery Patents

The United States

1,424,433 Tire trimmer. J. M. Angeletti, New York, N. Y.

1,424,470 Polygonal arrangement of presses and elevators for manipulating vulcanizing molds. H. R. Gilson, New Rochelle, N. Y., and G. F. Fisher, Providence, R. I., assignors to Revere Rubber Co., a Rhode Island corporation.

1,424,920 Washer-placing machine for rubber heel molds. J. H. Kintzele, A. Manheimer, and F. M. Etter, all of St. Louis, Mo.

1,424,931 Washer-placing machine for rubber heel mold. A. Manheimer, F. M. Etter, and J. H. Kintzele—all of St. Louis, Mo.

1,425,085 Apparatus and method for making cushion tires. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,425,147 Machine for constructing a laminated cohesive interlaid fabric. L. A. Subers, Lakewood, and E. Mosman, Cleveland—both in Ohio; said Mosman assignor to said Subers.

1,425,693 Tire mold. H. Raflovich, Buffalo, N. Y., assignor by mesne assignments to Slohm Tire & Mould Co., Inc., a New York corporation.

1,426,603 Electric repair vulcanizer. E. J. Rohne, assignor of ½ to O. Kr. Boe—both of Minneapolis, Minn.

1,426,865 Collapsible tire core. A. H. Harris, Barberton, O.

1,426,910 Tire buffer. M. A. Replogle, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

1,426,949 Device for recovering solvents. A. Boecler, Malmö, Sweden.

1,427,109 Tire repair vulcanizer. M. O. Kasson, Chicago, Ill.

1,427,217 Molding and vulcanizing machine. R. McClenathen, assignor to Kelly-Springfield Tire Co.—both of Akron, O.

1,427,271 Mixing machine for compounding plastics. E. Eger, assignor to Morgan & Wright—both of Detroit, Mich.

1,427,272 Mixing machine for plastics. E. Eger, assignor to Morgan & Wright—both of Detroit, Mich.

1,427,698 Lead-cable-covering press. R. Paliakoff, New York, N. Y.

The United Kingdom

181,056 Special apparatus for making tires. Dunlop Rubber Co., Ltd., 1 Albany street, Regent's Park, London, and C. Macbeth, Fort Dunlop, Erdington, Birmingham.

181,100 Solvent recovery apparatus. Dunlop Rubber Co., Limited, 1 Albany street, Regent's Park, London; W. K. Lewis, 85 Lombard street, and W. Green, 12 Garden Road—both in Newton, Mass., U. S. A.

181,285 Calender guard. J. L. Johnston, 48A, Lawnbrook avenue, Belfast.

181,312 Apparatus for molding plastic materials. H. Grossmann, 28 Englischviertelstrasse, Zürich, Switzerland. (Not yet accepted.)

181,314 Apparatus for molding plastic materials. H. Grossmann, 28 Englischviertelstrasse, Zürich, Switzerland. (Not yet accepted.)

181,315 Apparatus for molding plastic materials. H. Grossmann, 28 Englischviertelstrasse, Zürich, Switzerland. (Not yet accepted.)

181,355 Solvent recovery apparatus. Martini & Hüneke Maschinenbau Aktiengesellschaft, 122 Wilhelmstrasse; assignee of E. Hurlbrink, 2 Bachstrasse—both in Berlin. (Not yet accepted.)

181,446 Tire inflator. L. L'Heureux, 420 Lagauchetière Street East, Montreal, Can.

182,454 Apparatus for manufacturing galoshes, etc. M. Leroy, Voves, Eure-et-Loire, France. (Not yet accepted.)

The Dominion of Canada

221,568 Apparatus for curing tire casings in sectional molds. E. Hopkinson, New York City, U. S. A.

221,633 Tire shaping machine. The Canadian Consolidated Rubber Co., Ltd., Montreal, Que., assignee of H. V. Lough, Hartford, Conn., U. S. A.

221,634 Fabric gage. The Canadian Consolidated Rubber Co., Ltd., Montreal, Que., assignee of A. O. Abbott, Jr., Detroit, Mich., U. S. A.

221,957 Machine for mounting tires. The Canadian Consolidated Rubber Co., Ltd., Montreal, Que., assignee of R. Brushwiller and A. Otto, Detroit, Mich., U. S. A.

221,958 Portable mold closing press. The Canadian Consolidated Rubber Co., Ltd., Montreal, Que., assignee of H. V. Lough, Hartford, Conn., U. S, A.

221,959 Power transmitting device. The Canadian Consolidated Rubber Co., Ltd., Montreal, Que., assignee of H. V. Lough, Hartford, Conn., U. S. A.

222,027 Apparatus for turning inner tubes. H. C. Privett, Los Angeles, assignor, C. R. Privett, Long Beach, assignee of ½ interest, and H. F. Privett, assignee of ¼ interest—all in California, U. S. A.

222,295 Molding machine for plastics. The Cutler-Hammer Manufacturing Co., assignee of F. E. Layman—both of Milwaukee, Wis., U. S. A.

222,303 Apparatus and method for making tire treads. The Firestone Tire & Rubber Co., assignee of W. H. Bines—both of Akron, Ohio, U. S. A.

222,304 Takeoff mechanism for rubber mills. The Fisk Rubber Co., Chicopee Falls, Mass., assignee of The Federal Rubber Co., Cudahy, Wis., assignee of S. Dietrich, Cudahy, Wis.—both in U. S. A.

222,336 Apparatus for manufacture of rubber jars. The Rub-Tex Products, Inc., assignee of L. E. King—both of Indianapolis, Ind., U. S. A.

222,383 Tire mold. H. Raflovich, Buffalo, New York, U. S. A.

222,398 Control for tire-stripping machine. The Canadian Consolidated Rubber Co., Ltd., Montreal, Que., assignee of M. Davis, Detroit, Mich., U. S. A.

223,139 Strip cutting machine for manufacture of tire casings. The Dunlop Rubber Co., Ltd., Regents' Park, London, assignee of J. V. Worthington, Axminster, Devon—both in England.

223,175 Buffing machine for tire beads. H. D. Stevens and E. D. Putt, coinventors—both of Akron, Ohio, U. S. A.

223,210 Machinery for forming foundation of pneumatic tire casings. J. Healey and W. & A. Bates, Limited, Leicester, and Francis Shaw & Co., Limited, Manchester, assignee of 1/3 of the interest—all in England.

Germany

Patents Issued, with Dates of Issue

359,344 (April 24, 1921) Machine for removing casings from cores. The B. F. Goodrich Co., New York; represented by Benjamin Wertheimer, Berlin S. W. 11.

359,758 (October 1, 1921) Mechanism for indicating the reduction of pressure in pneumatic tires. Friedrich Seelig, Jr., Gerthe, near Bochum.

359,817 (November 13, 1921) Vulcanizing press as tool box. Walter Bornschein, Dortmunderstrasse 15, Berlin.

360,295 (September 10, 1919) Grinding machine for cutting and pulverizing materials like rubber. Naamlooze Vennootschap Verschure & Co.'s Scheepswerf en Machinefabriek, Amsterdam, Holland; represented by K. Hallbauer and A. Bohr, Berlin S. W. 61.

Design Patents Issued, with Dates of Issue

820,295 (June 12, 1922) Mechanism for putting casings and tubes on automobile felloes. Sylvester Piszalla and Alois Köhler, Zaborze-Dorf, Kr. Hindenburg.

821,380 (June 22, 1922) Belting connection with tension regulator. Karl Krause, Zittau.

821,941 (February 10, 1922) Device for putting on rubber heels. Alois Pohl, Siegen.

822,372 (June 12, 1920) Mechanism for cutting and slanting the ends of solid rubber tires. The Dunlop Rubber Co., Limited, London; represented by R. H. Korn, Berlin, S. W. 11.

822,500 (July 17, 1922) Mold box for rubber articles. Maschinenfabrik Peter Kölzer, Düsseldorf-Oberbilk.

822,581 (June 18, 1920) Machine for calendering rubber strips. The Dunlop Rubber Co., Limited, London; represented by R. H. Korn, Berlin S. W. 11.

Process Patents

The United States

1,424,332 Repairing fabric of filter press sacks by inserting vulcanizable material and curing. A. O. Austin, Barberton, assignor by mesne assignments to The Ohio Brass Co., Mansfield—both in Ohio.

1,424,386 Forming inner tubes. A. W. Stoner, assignor to The Miller Rubber Co.—both of Akron, O.

1,425,306 Coated fabric and process of manufacture. J. A. Wilson, Elizabeth, assignor to The Duratex Co. Newark—both in New Jersey.

1,425,307 Coated fabric and process of manufacture. J. A. Wilson, Elizabeth, assignor to The Duratex Co., Newark—both in New Jersey. (Original application divided.)

1,426,927 Manufacture of pneumatic tires. J. A. Swinehart, Akron, O.

The Dominion of Canada

222,222 Producing ornamental rubber fabric. H. Joseph, Grayling, Mich., U. S. A.

222,519 Reinforcing pneumatic inner tubes with large-mesh fabric. M. Gregory, Tacoma, Wash., U. S. A.

222,890 Manufacture of cushion tires. The B. F. Goodwin Co., New York, N. Y., assignee of J. R. Gammeter, Akron, O.—both in U. S. A.

Germany

Patents Issued, with Dates of Issue

358,575 (September 14, 1919). Method for making air tubes. Isaac Benjamin Jeffries, Llanelly, England; represented by Dr. Landenberger, Berlin, S. W. 61.

359,757 (August 9, 1921) Method for making tubes for pneumatic tires. The Dunlop Rubber Co., Limited, London; represented by Dr. R. Wirth; Weihe; Dr. Weil; M. M. Wirth, of Frankfort-on-the-Main; Koehnhorn and Noll—both of Berlin, S. W. 11.

360,383 (June 17, 1920) Process for making smooth and clear gumplates of rubber for artificial teeth. Hermann Heinrich Nernst, Räcknitzstrasse 3, Dresden.

The Editor's Book Table

Book Reviews

"PNEUMATIC TIRES." AUTOMOBILE, TRUCK, AIRPLANE, MOtorcycle, Bicycle. An Encyclopedia of Tire Manufacture, History, Processes, Machinery, Modern Repair and Rebuilding, Patents, Etc, Etc. By Henry C. Pearson, F. R. G. S., Editor of THE INDIA RUBBER WORLD. Published by The India Rubber Publishing Co., 25 West 45th street, New York, N. Y. Cloth, 1323 pages, 6 by 9 inches, 900 illustrations.

EVERYBODY in any way interested or concerned in the design, manufacture, distribution, sale, use, care or repair of pneumatic tires of every sort will find that this practical, authoritative and comprehensive handbook fills a long-felt and often-expressed need. Written in readable style, neither too elementary for the trade nor too technical for the layman, it is the whole story of the evolution of the pneumatic tire from its inception to the present day and has been justly termed an encyclopedia of the rubber tire industry. The building of a tire is described in detail from the gathering of the raw materials to the inspection of the finished product, together with many pertinent allied matters. Fifty profusely illustrated chapters summarize most of the known information on this important subject, while frequent subheads, an expanded table of contents and a 33-page alphabetical index facilitate ready reference.

Important developments in the theory and history of pneumatic tires, also the sources of crude rubber and the preliminary processes in rubber and tire manufacture are outlined in the opening chapters. Sixteen entire chapters and sections of eight others illustrate and describe the best tire machinery and there is a comprehensive list of the imporant tire machinery patents of the world. Three chapters are devoted to cotton and fabrics, including bias fabrics, their weaves, manufacture and testing. All types and aspects of cord tires and their manufacture are covered in three chapters. Hand and machine methods of fabric tire building are treated in two chapters. The manufacture of bicycle and motorcycle tires receives three chapters; inner tubes, two chapters. Seven comprehensive repair chapters cover inner tube mending, fabric and cord tire rebuilding and retreading, repair shop machinery and equipment. A chapter each is devoted to tire fillers; flaps, reliners and blowout patches; tests and testing machines; sizes and inflation; rims and fastenings; pumps; valves; tools and accessories; treads and anti-skid devices; tire care; roads for tires; reclaiming tire rubber and fabric, and a summary of the tire industry today. Many typical compounds for tire and tube rubber stocks, cements, fillers, etc., furnish a valuable feature, and throughout the work much attention has been devoted to specifications and standards.

"MARKET FOR RUBBER PRODUCTS IN THE UNITED KINGDOM." By P. L. Palmerton, chief, Rubber Division, Department of Commerce. Trade Information Bulletin No. 60. Published by Bureau of Foreign and Domestic Commerce, Washington, D. C. Paper, 6 by 9 inches.

This carefully prepared bulletin contains a wealth of information regarding the rubber industry of the United Kingdom, as well as the share of other countries in this trade. Such information is of particular interest to rubber manufacturers in the United States, as England represents easily our leading export market. During the calendar year 1921 our exports of all kinds of rubber goods to that country amounted to $5,246,018, while for the first six months of the present year the value of automobile tires alone exported to England from this country reached a value of $1,840,152. In this particular product, however, the United States is meeting keen competition, tire companies ranking in the following order: The Michelin Co. (France); the American companies; the British companies; Pirelli (Italy); and Continental (German). The trade in American rubber footwear is principally in four or five makes, as is also the case with automobile tires

"RUBBER SITUATION IN BRITISH COLONIES AND PROTECtorate." Supplement to *Commerce Reports*. Trade Information Bulletin No. 49. Published by Government Printing Office, Washington, D. C. Paper, 6 by 9 inches.

An investigation of the rubber industry in the British colonies and protectorates, and of the many suggestions for relieving the situation. Two of these seemed especially practicable. The essential differences between the two schemes are that the first prohibits output over a fixed percentage and secures no revenue to the state, while the second would have a tendency to restrict exports over a fixed percentage—but not directly production—and bring in a revenue to the state, and should not prove difficult to administer. This report, which includes some important statistics, was prepared May 19, 1922, at a time when the attitude of the Dutch planters was not yet definitely known.

"FACTS AFFECTING THE IMPORTATION OF RUBBER PRODUCTS into India, Japan and Chosen, and Australia." Separate monographs prepared by the Rubber Division, Department of Commerce, P. L. Palmerton, chief. Published by Bureau of Foreign and Domestic Commerce, Washington, D. C. Paper, 8 by 9 inches.

Detailed statistics concerning the rubber industry in these countries furnish much that is of interest, while the indications of the development of rubber manufacture in Japan are truly astonishing.

It is evident that Australia's high tariff renders rubber trade with the United States particularly difficult. Except in the case of automobile tires, rubber belting, and surgical supplies, the American trade appears to be declining and is easily outstripped by Great Britain and Canada. It is estimated that the local industry now supplies 60 per cent of the Australian demand for rubber goods, and over 20 per cent of the demand in New Zealand.

"STANDARD METHODS OF CHEMICAL ANALYSIS." A MANUAL of Analytical Methods and General Reference for the Analytical Chemist and for the Advanced Student. Edited by Wilfred W. Scott. Third edition, 1922. D. Van Nostrand Co., New York, N. Y. Two volumes. Cloth, illustrated, 1567 pages, 6 by 9 inches.

This well known and standard work, edited by Wilfred W. Scott in collaboration with thirty-six others, is an acknowledged authority on methods for the chemical analysis of both organic and inorganic materials. Each chapter is the work of an expert in the subject treated.

Volume I is devoted to elemental substances, qualitative tests, and tables of useful data. Volume II covers acidimetry and alkalimetry, alloys, oils, fats and waxes, soap and soap products, paints, cement, coal, gas, asphalts, tars and pitches, rubber, explosives, water, determination of solubility, methods of sampling solids, liquids and gases, etc. The work is well indexed and is an invaluable addition to the library of the analyst.

"FLUIDITY AND PLASTICITY." BY EUGENE C. BINGHAM, PH.D. Professor of Chemistry, Lafayette College, Easton, Pennsylvania. First Edition, 1922. McGraw-Hill Book Co., Inc., New York. Cloth, 440 pages, 5½ by 8. Illustrated.

In this very important work the author devotes Part I to viscometry, discussing methods of measurement, the law of Poiseuille, viscosity as a definite physical quantity, and the viscometer. Part II is devoted to fluidity and plasticity and other physical properties, colloidal solutions, plasticity of solids, viscosity of gases, superficial fluidity, lubrication, and applications of the viscometric methods to practical problems.

In the Appendix practical viscometry is taken up, followed by practical plastometry, and technical viscometers. The measurements of Poiseuille are given in detail. The volume contains a subject index and a very full bibliography and author index.

This volume is of great interest and practical value and a notable addition to the series of which it is a part.

Abstracts of Recent Rubber Articles

Partial Coagulation of Latex. By adding to latex one-third of the usual proportion of acetic acid and subsequently completing coagulation by the addition of the remainder of the acid, it was possible to separate the rubber into two fractions. The first fractions, which contained the bulk of the rubber, were generally darker and showed a greater tendency to "spot disease"; they also vulcanized a little more rapidly and exhibited appreciably higher breaking strain.—H. P. Stevens. *The Bulletin of the Rubber Growers' Association*, 1922, 4, 196-197.

Latex Coagulation with "Toddy." Smoked sheet rubber which had been prepared from rubber coagulated by the addition of 600 cc. of naturally fermented "toddy" to 3,000 cc. of standardized latex, vulcanized at approximately the same rate as standard crêpe rubber, but in other respects exhibited the normal properties of smoked sheet rubber.—H. P. Stevens. *The Bulletin of the Rubber Growers' Association*, 1922, 4, 197.

The Composition of "Golden Antimony Sulphide." The author refers to the renewal of interest in the composition of antimony pentasulphide and draws attention to the very careful work of O. Klenker on the subject[1] in which he emphasized, like recent investigators, the frequently contradictory character of the results of previous workers as to the behavior of so-called antimony pentasulphide toward solvents of free sulphur. His experiments revealed the fact that in antimony pentasulphide the proportion of actual pentasulphide to trisulphide with free sulphur, was dependent to a great degree on the conditions under which the substance was brought into existence. He was unable by any method to obtain pure pentasulphide, his richest products containing this together with a small proportion of trisulphide and the corresponding quantity of removable free sulphur.—D. F. Twiss. *The Journal of the Society of Chemical Industry*, May 31, 1922.

[1]Journal of Practical Chemistry, 1899, 59, 150-199 and 353-433.

Power Losses in Automobile Tires[1]. This paper relates to the power loss or energy dissipated as heat in automobile tires when operated under different conditions of axle load, inflation pressure, speed and traction effort.

The tests show that in general the loss increases directly with an increase in speed or axle load and that it increases quite rapidly with decrease in air pressure below the standard. Tractive effort has a comparatively small effect on the power loss. There is a wide variation in different tires run under the same conditions. Some tires show a larger power loss than others, and fabric tires as a class show a considerably greater loss than cord tires.—W. L. Halt and P. L. Wormeley, associate mechanical engineer and physicist, respectively, Bureau of Standards.

[1] Technologic Paper No. 213. Bureau of Standards, Washington, D. C.

Research on Design, Quality and Uniformity Essential to the Rubber Industry. The author points out that the major problem of the rubber industry is to produce rubber goods in a way to maintain in each of them an endurance quality. The production engineer should harmonize labor and processes that each unit may equal in service value each other unit. This is essential to maximum production. Accelerator work and reclaiming are the two greatest advances made since the discovery of vulcanization, but methods of mixing and handling vulcanized rubber are still much as they were 70 years ago. Research to give greater adaptability of rubber compounds to broader uses is opening a vast field of investigation.—By W. C. Geer, vice-president in charge of development, The B. F. Goodrich Co., Akron, Ohio.

New Trade Publications

A LARGE AND ATTRACTIVE FOLDER, ILLUSTRATING MANY AND various types of rubber mill machinery, is being sent out by The Farrel Foundry & Machine Co., Ansonia, Connecticut. An interesting feature of this bulletin is a representation of this company's old plant, as it appeared in 1848, when the firm was organized, in comparison with a photograph showing the many buildings which constitute the plant of today.

A NEW AND PROFUSELY ILLUSTRATED CATALOG HAS BEEN ISSUED by The Bristol Co., Waterbury, Connecticut, devoted to its line of pyrometers of both indicating and recording types. Bristol pyrometers are listed and sample chart rulings shown, adapted for heat measurements for every industrial need. Sundry parts, fixtures, applications and diagrams are shown. A collection of this company's catalogs would form in effect a valuable text book on what is claimed by the makers to be the most extensive line of recording instruments in the world.

A NEW CATALOG, ILLUSTRATED IN COLOR, AND ENTITLED "RUBBER Goods for the Haberdasher," is being sent out by The Miller Rubber Company of New York, Akron, Ohio. In this publication a number of styles of belts for men and women are featured, as well as various articles for bathing wear, such as caps, belts, and swimming tubes. Various garments for infants' use are also manufactured by this company.

THE SEPTEMBER ISSUE OF *The Weather Vein*, A LITTLE PUBlication sent out by The Carrier Engineering Corporation, 750 Frelinghuysen avenue, Newark, New Jersey, contains in its brief articles some interesting ipformation regarding "manufactured weather," while a number of photographs represent interiors of important plants where this particular type of equipment has been installed. Special mention is made of the utilization of this system at the tire fabric plant of The Bibb Manufacturing Co., Macon, Georgia.

ACKNOWLEDGMENT IS MADE OF VARIOUS INTERESTING HOUSE organs sent out by the following rubber companies: The Firestone Tire & Rubber Co., "Firestone News Service"; The Goodyear Tire & Rubber Co., "The Wingfoot Clan"; The Spreckels "Savage" Tire Co., "The Wigwam"; and The Odell Rubber Co., "Chords."

A FOREIGN COMMERCE HANDBOOK JUST ISSUED BY THE FOREIGN Commerce Department of the Chamber of Commerce of the United States is a handy reference book for the busy exporter or importer. It contains a list of the topics of national importance that are engaging the attention of the National Chamber's Foreign Commerce Department Committee. As the first publication of its kind this handbook meets a distinct need in foreign trade circles.

Judicial Decisions

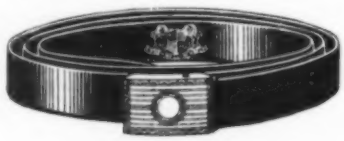
O'SULLIVAN RUBBER CO., INC., VS. GENUINE RUBBER CO., ET AL. United States Circuit Court of Appeals, First Circuit. Appeal from the District Court of the United States for the District of Massachusetts. Decided April 11, 1922.

In this case regarding the alleged infringement of a patent for a suction recess heel, the decision having been rendered in favor of the defendants, the Genuine Rubber Co., the case was appealed by the complainant, the O'Sullivan Rubber Co. The final ruling was that the decree of the district court dismissing the bill should be reversed, and that an injunction should issue against the defendants, enjoining them from putting upon the market their heel and cartons, except with certain specified modifications. The cause was also remanded to the district court for further proceedings not inconsistent with this opinion, with costs to the appellant.—*Federal Reporter*, Vol. 279, page 972.

New Goods and Specialties

Rubber Belts and Swimming Tube

THE "Rellim" high grade rubber composition belt, with smooth, stitched, pebbled, or walrus finish, is said to be durable, washable, and non-absorbent, and will not fade, shrink, or stretch. Men's and women's rubber belts include the "Compo," "Marveltex," and "C-Kure"; also the "Two-Tone" colored bathing belt, white on one side and reversible. All have metal or enamel buckles.



"Rellim" Belt

The "Swim-Boy" swimming tube is worn under the arms and is inflated with a bicycle pump. It is blue in color and the valve is covered by a rubber band.—The Miller Rubber Co., Akron, Ohio.

Improved "Humidyzor" Pouch

"Everclosed Humidyzor" Pouch

Dealers in novelties and smokers' materials are stocking the "Everclosed Humidyzor" rubber-lined tobacco pouch with a small outlet spout at one corner. This makes for convenience, eliminates waste, and keeps the contents moist, without opening the pouch. The top opening is closed with snap buttons. —H. L. Rogers Co., 100 Fifth avenue New York, N. Y.

Tire Inflator or Fire Extinguisher

The "Gimick" tire inflator will inflate a tire to 55 or 65 pounds pressure in a few seconds without jacking. This device is operated by screwing it on the valve stem and turning the cylinder of the "Gimick" while holding cap. A reverse turn shuts off the CO_2 gas contained in the cylinder. This gas is also convenient to use in extinguishing small fires.—Gimick Tire Inflator Co., 1323 Arch street, Philadelphia, Pennsylvania.

"Gimick" Tire Inflator

New Heel Features

A new rubber heel, concave on both inside and face, has molded into it at the back a crescent-shaped piece of "Uskide," furnishing the nonskid feature. The inventor of this patented heel claims it will give a flat walking surface and a suction grip simultaneously.—E. R. Hodson, 1932 Troost avenue, Kansas City, Missouri.

Hodson Heel

Bal for Autumn Sports

The demand for an all around sport shoe for both basketball and gymnasium wear as well as general outdoor exercise has resulted in the "Arena Bal," in the laced-to-toe style. Of "balanced construction," it is made for girls and women as well as boys and men, of extra heavy natural duck, with brown rubber ankle patch and toe cap, double foxing, and extra heavy brown rubber suction sole. High grade materials and workmanship are used throughout. The "Kendex" insole used in this shoe is said to be moisture-proof, fast color, cool, and foot-conforming.— Firestone Apsley Rubber Co., Hudson, Massachusetts.

"Arena Bal"

All-Weather Boots

The popularity of rubber-soled and high fabric top boots, gaiters, and galoshes for women and girls last winter resulted in a demand for styles more chic and conservative than the flapper type, and many attractive models have been developed. Of the two styles shown here, the "Radio" boot, is particularly distinctive for its snug fit, which is attained by making the top of elastic material. Though there is no opening other than where the foot goes in, the "Radio"

"Radio" Boot

Empress Gaiter "De Luxe"

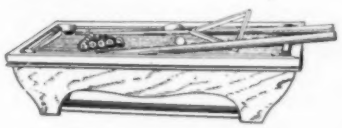
boot, without fastening, slips on over the shoe and the top is trimmed with the "Fit-Clos" reversible cuff of gray or black astrakhan fur. The Empress gaiter boot "De Luxe" has gray or navy-blue top, with gray astrakhan cuff, and fastens with four silk frogs.—Cambridge Rubber Co., Cambridge, Massachusetts.

Folding Tea Wagon

Rubber tires on tea wagons are not new, but a recent model of all-steel construction folds up out of the way when not in use. The 10-inch front wheels and 4½-inch rear ones are equipped with ½-inch rubber tires. —The Fulton Co., Bay City, Michigan.

Rubber Cushioned Parlor Pool Table

The rubber-cushioned "Return Pool" table for parlor use, illustrated here, is made in four sizes from 12 by 22 to 18 by 36 inches, and is finished in mahogany. The balls drop from the pockets to the racks beneath. — William Fuld, Harford and Lamont avenues and Federal street, Baltimore, Maryland.



Parlor "Return Pool" Table

Nonskid Heel

The "Hood Arrow" heel, which is slightly concave on the inside to make it fit tightly, also has eight nailholes to insure tightness at the edge. Raised rubber portions around these nailholes provide the nonskid feature, and the heel is decorated with the Hood quality guaranty molded into the center.—Hood Rubber Products Co., Inc., Watertown, Massachusetts.

"Hood Arrow" Heel

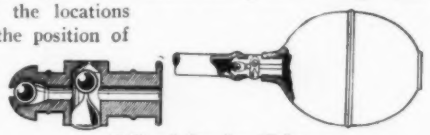
Studs Molded in Golf Sole

"Canny Grip" Golf Shoe

The "Canny Grip" golf shoe is one of the newest developments of the rubber sole as adapted to sports footwear. Studs, so arranged that the wearing surface is greatest where the most wear comes, are molded as an integral part of the rubber middle sole. The outer studs are raised higher than those on the inner side so that the shoe will not run over, thus providing a sure, firm stance.—The Commonwealth Shoe & Leather Co., Whitman, Massachusetts.

Ball Bearing Valve

A new valve suitable for use in atomizer bulbs and other devices is the Holland Duplex with double-acting ball bearing. The illustrations show the locations of the balls and the position of the valve in the bulb. This valve can be cleaned with a brush and moistened with a lubricant.—Holland Instrument Co., 2314 North 11th street, Philadelphia, Pennsylvania.



Holland Duplex Valve

Stitchless "Pivot" Garter

A new garter for men has no stitching to cut the elastic and is made in both wide and standard width webs. In the center of a perspiration-proof shield is a metal pivot over which the ends hook and on which all the pull and strain come. The garter tab is furnished with the usual rubber button. —The Kabo Co., Chicago, Illinois.

Men's "Pivot" Garter

Electric Curler with Hard Rubber Plug

One of the newest curling irons, the "Wavette," for electric heating, has a hard rubber cord-connector plug for insertion in the handle.—The Frank E. Wolcott Manufacturing Co., Hartford, Connecticut.

"Wavette" Electric Curler

Buckled Boot

The "Oh Boy" gaiter boot is another style of the popular models for the coming winter. A strap cemented on at the back buckles around the ankle and the top may be turned over to show the colored lining. This gaiter is made on a two-piece last. —Converse Rubber Shoe Co., Malden, Massachusetts.

"Oh Boy" Gaiter Boot

"Dreadnaught" Cord

"Dreadnaught Paranite" portable cord for hard wear on tools, etc., has a thick rubber cover of the quality used in tire treads. Pressure forces the soft, unvulcanized rubber over the double conductors which are insulated with 30 per cent rubber and braided with an indicating tracer, and when vulcanized under pressure, a dense rubber wall is produced.—Indiana Rubber & Insulated Wire Co., Jonesboro, Indiana.

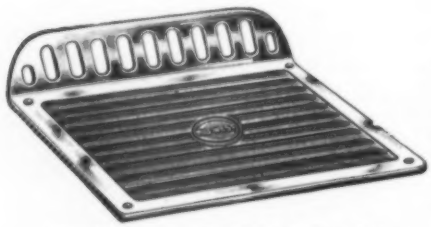
Swimming Suspenders for All

An unusual swimming device is the "Neptune" inflated swimming suspenders, made of rubber, and inflated through valves by the wearer's breath. The "Neptune" is made in three sizes to fit children, adults, and unusually large persons, and all sizes are adjustable.—Thos. E. Wilson Co., 701 North Sangamon street, Chicago, Illinois.

"Neptune" Safety Swimmer

"Ideal" Bathing Garters

Howard's "Ideal" bathing garters, patented by the inventor, are cut from thick sheet rubber and have a series of holes punched in one end. In the other end through one hole is inserted a double-headed bone button. The garter is fastened and adjusted by forcing the button head through one of the holes in the opposite end.—The Ohio Rubber Co., 725 St. Clair avenue, N. W., Cleveland, Ohio.



Aluminum Bordered Rubber Step Mat

Step Mat

A new automobile step mat combines an aluminum border and black rubber center, with kick plate attached, and is said to be meeting with much success as a fast seller.—Mid-West Rubber Co. 18th street and Chester avenue, Cleveland, Ohio.

"Clincher" Rubber Elbow Shooting Pad

A new rubber shooting pad buckles securely around the elbow, a knurled center design giving secure grip on any surface.—The North British Rubber Co., Ltd., Castle Mills, Edinburgh, Scotland.

Miller's Black Cord

A new black cord tire has a cog tread with wide center rib to give longer wear and make steering easier. —Chas. E. Miller, Anderson Rubber Works, Anderson, Indiana.

Inflatable Bathing Suit

A bathing suit recently introduced at Coronado Beach, California, has a rubber air container incorporated within it, forming a series of up and down curves around the body under the arms. It is inflated through a short rubber tube equipped with a suitable valve.

© Underwood & Underwood.

Inflating the Suit

Interesting Letters from Our Readers

Classifying Tires Suggested

To the Editor:

Dear Sir: Our view of the present situation affecting the rubber trade in America is that the public is the chief sufferer and we offer a thought, assuring you that we would be pleased to receive an expression from yourself as to whether or not you think it feasible.

That through The Rubber Association of America or the Department of Commerce, Bureau of Standards, or some other constituted bureau of authority to whom the rubber manufacturers might subscribe, automobile casings and inner tubes be classified, bearing the seal of constituted authority as to classification.

As a suggestion: Class "A" to conform to government specifications as to size, material, tensile strength, etc.; Class "B" to grade a fixed percentage under Class "A"; Class "C" likewise; Class "D" N. F. C., seconds, etc.

We personally believe that the idea has some merit and if adopted would go a long way toward curing the existing evils of the trade, the chief of which, to our mind, has been misrepresentation, which once eliminated would be the cure of other evils.

The Lancaster Tire & Rubber Company,
Columbus, Ohio. G. T. Currier, Sales Manager.

Standard Warranty a Boon

To the Editor:

Dear Sir: The Rubber Association advises me that ninety-six manufacturers are at the present time operating under the Standard Warranty, and that they represent practically all of the tire manufacturers who are today in operation. This is rather an interesting statement, especially so since it is very hard to check the actual number of tire manufacturers in the country, unless it be through the medium of The Rubber Association of America.

For example: The July, 1922, *Tire Rate Book* lists 270 separate list prices for tires as against 239 in the April issue. It is also interesting to note, in accordance with this book that 209 of the 230 listed in April, are making cord tires, and that 168 of the 270 manufacturers listed in July make cord tires.

Many of the list prices shown in the *Tire Rate Book*, however, represent special brand tires, made by manufacturers for various distributing agencies, and it is therefore only through the medium of an actual manufacturers' list, such as The Rubber Association has, that we are able to get any true picture as to the size of the tire manufacturing industry as a whole.

In my estimation the elimination of the "tire guarantee" has, at last, thrown each manufacturer upon his own resources, rather than permitting him to capitalize upon the confidence of the public on a mistaken idea. The public has placed upon the words, "tire guarantee" an entirely too literal interpretation.

Any gyp tire manufacturer or gyp distributer would glibly guarantee his tire for exactly the same mileage as any reputable manufacturer and a great many car owners would accept that guaranty on the face value, little appreciating that a guaranty is only of value in direct proportion to the stability and the reputation of the person or the concern giving that guaranty.

Little do the car owning public seem to appreciate that a guaranty from a tire dealer or a manufacturer who, although in business today may be out of business tomorrow, means actually nothing and is often worth less than the paper upon which it is written.

It seems to me that if we all continue to adhere to the Standard Warranty, each manufacturer must build up for himself a reputation for fair treatment and value in the minds of the public which will establish an individual standard and acceptance of quality as they today demand in other merchandise which they purchase.

Thermoid Rubber Company,
Trenton, New Jersey. John T. Spicer.

News of the American Rubber Trade

Financial

THE Continental Rubber Company of New York, last July, increased its authorized capital from $50,000 to $370,000.

The Mason Tire & Rubber Co.

The Mason Tire & Rubber Co. has called a special meeting of stockholders for October 17, to approve a refinancing plan involving the sale of $2,000,000 worth of first mortgage bonds and the sale of 200,000 shares of no par common stock at $12.50 a share. The new financing is required to complete payment for the Owen Tire & Rubber Co. plant, which was taken over recently and placed in operation; also for retiring $540,000 worth of 7 per cent serial gold notes. The stock of the company will be listed on the New York Stock Exchange if plans now under way are completed.

The Fisk Rubber Co.

The Fisk Rubber Co. for six months ended June 30, 1922, reports surplus of $1,111,191, after interest, amortization, etc. This is equivalent to 50 cents a share earned on outstanding 743,949 shares of common stock of no par value, after allowing for dividend requirements on preferred stocks.

Surplus account for the six months follows:

Net profits	$1,774,024
Interest, amortization, etc	662,833
Surplus	$1,111,191
Previous surplus	1,873,417
Profit and loss surplus	$2,984,608

ASSETS

Balance sheet as of June 30, 1922, compares as follows:

	1921	1922
Property account	$21,030,134	$21,670,456
Investments	2,663,653	3,726,038
Treasury common stock	.....	49,354
Inventories	18,832,839	13,131,529
Advances	1,047,758	.....
Accounts and notes receivable less reserve accounts receivable	11,279,036	10,472,777
Notes receivable	952,803	623,378
Collateral notes for employes for subscription to capital stock	31,307	.....
Cash	3,229,695	3,682,748
Deferred charges	1,537,091	1,437,554
Totals	$60,604,317	$54,793,835

LIABILITIES

First preferred stock	$18,951,500	$18,951,500
Management stock	15,000	15,000
Second preferred stock	2,135,100	2,125,100
Common stock	6,115,545	6,397,905
Employes' stock subscriptions	264,586	50,596
First mortgage bonds	10,000,000	9,568,000
Purchase contract	588,379	205,979
Loans payable	15,050,186	7,045,000
Accounts payable	1,980,680	2,437,271
Accrued bond interest	.....	255,147
Federal taxes	129,530	.....
Reserves	5,373,811	4,757,729
Surplus	.....	2,984,608
Totals	$60,604,317	$54,793,835

Inventories show a reduction of 30 per cent compared with a year ago and company states it has no forward commitments at other than current prices. Stocks of rubber and fabric on hand are sufficient only for immediate production requirements and finished products are at a minimum, based on present sales requirements. Net sales volume for first six months this year showed an increase of 23 per cent over corresponding period last year while unit sales increased 85 per cent.

New York Stock Exchange Quotations

SEPTEMBER 26, 1922

	High	Low	Last
Ajax com	14½	14	14½
Fisk com	13⅛	12⅞	12⅞
Goodrich com	33¾	33½	33½
Kelly-Springfield com	43	42⅝	43
Lee com	25½	25½	25½
United States Rubber com	51	49⅝	50½
United States Rubber 1st pfd	97¾	96	97⅛

Akron Rubber Stock Quotations

Quotations of September 24, supplied by App-Hillman Co., Akron, Ohio.

	Bid	Asked
Firestone com	73	78
Firestone 6% pfd	90	91
Firestone 7% pfd	85½	86
General com	250	..
General pfd	*95	97
Goodrich com	33	35
Goodrich pfd	*83	85
Goodrich 6½% bonds	101½	102
Goodyear com	10½	10⅝
Goodyear pfd	28¼	29¼
Goodyear prior pfd	62	63½
Goodyear 8% bonds	116	116½
Goodyear 8% deb	100	100½
India Rubber	76	..
India Rubber com	90	..
Mason com	7½	9
Mason pfd	45	50
Miller com	70	72
Miller pfd	98	99
Mohawk	..	75
Seiberling com	8	8½
Seiberling pfd	45	50
Star rubber com	25	25

*Ex. dividend.

Dividends Declared

COMPANY	STOCK	RATE	PAYABLE	STOCK OF RECORD
Allis Chalmers Manufacturing Co.	Pfd.	$1.75 q.	Oct. 16	Sept. 25
Bliss, E. W., Co.	Com.	$0.55 q.	Oct. 2	Sept. 23
Bliss, E. W., Co.	1st Pfd.	$1.00 q.	Oct. 2	Sept. 23
Bliss, E. W., Co.	2d Pfd. B	$0.15 q.	Oct. 2	Sept. 23
General Tire & Rubber Co., The.	Pfd.	1½% q.	Oct. 1	Sept. 20
Hood Rubber Products Co., Inc.	Pfd.	1¾% q.	Sept. 1	Aug. 24
Kelly-Springfield Tire Co.	6% Pfd.	$1.50 q.	Oct. 2	Sept. 15
Miller Rubber Co., The.	Pfd.	2% q.	Dec. 1	Nov. 10
Mohawk Rubber Co., The.	Pfd.	1¾% q.	Oct. 1	Sept. 25
New England Tire & Rubber Co., The	Pfd.	2% ..	Oct. 15	Sept. 15
United Shoe Machinery Corporation	Com.	$0.50 q.	Oct. 5	Sept. 19
United Shoe Machinery Corporation	Pfd.	$0.37½q.	Oct. 5	Sept. 19
Westinghouse Electric Mfg. Co.	Com.	$1.00 q.	Oct. 31	Sept. 30
Westinghouse Electric Mfg. Co.	Pfd.	$1.00 q.	Oct. 16	Sept. 30

New Incorporations

Aetna Tire & Rubber Co., The, July 29 (New Jersey), $2,000. C. J. and C. M. Downing, both of South Orange, New Jersey; D. R. Downing, New York City. Principal office, 550 Broad street, Newark, New Jersey. To manufacture, purchase and exchange automobile tires, tubes, etc.

Aladdin Tire Corporation, June 21 (New Jersey), 2,500 shares of no par value. C. A. Bates, president; F. A. Goddard, vice-president; B. Greene, secretary, all of Rutherford, New Jersey. Principal office, East Rutherford, New Jersey. To manufacture and sell cord tires.

Celina Co., The, August 21 (Ohio), $25,000. R. W. and C. W. Oliver; E. W. and J. B. Bassett; J. C. Cochrane. Principal office, Toledo, Ohio. To manufacture rubber goods.

Century-Plainfield Rubber Co., August 10 (New Jersey), $2,000. N. Saks, president; L. J. Franzblau, vice-president; J. M. Saunders, secretary; H. C. Schleicher, treasurer. Principal office, Plainfield, New Jersey. To manufacture and sell rubber tires, tubes and all other articles made of rubber of every description whatsoever. (Successor to Century-Plainfield Tire Co.)

Congo Rubber Co., September 11 (Delaware), $1,000. M. M. Lucey; L. C. Browne; L. S. Dorsey, all of Wilmington, Delaware. Delaware agent, Colonial Charter Company, 927 Market street, Wilmington, Delaware. To manufacture any article made in whole or in part of rubber, or the by-products thereof.

Davis-Jones Insulated Wire Co., May 29 (Rhode Island), $80,000. D. S. Davis, president and treasurer; J. T. Jones, vice-president and assistant treasurer; J. F. Murphy, secretary. Principal office, Pawtucket, Rhode Island. To manufacture and deal in all kinds of insulated wire.

Easton Avenue Tire Works, July 6 (Missouri), $10,000. E. Hilty, president; J. H. Tice, vice-president; O. S. Norton, secretary. Principal office, 5839 Easton avenue, St. Louis, Missouri. To deal in tires and tubes and conduct vulcanizing business.

Goble Rubber Products Co., August 24 (Delaware), $50,000. H. L. Smith; M. L. Merchant; J. M. Whitford, all of Cleveland, Ohio. Delaware agent, Homer J. Smith, Wyoming, Delaware. To construct rubber plants.

Goodnow, C. A., Shoe Co., August 25 (Massachusetts), $150,000. C. A. Goodnow, 424 North Main street, Natick, Massachusetts; E. F. Abbott, Auburn, Maine; J. T. Hollis, Hingham, Massachusetts; W. F. Garcelon, 608 Sears Building, Boston, Massachusetts. Principal office, Boston, Mass. To purchase, sell and manufacture boots, shoes, rubbers and wearing apparel.

Ideal Waterproof Fabric Co., August 28 (New York), $20,000. S. Forscher; A. Lillienthal, both of 261 Broadway; M. Klein, 29 Broadway, all of New York City. Principal office, 443 Broadway, New York City. To manufacture rubber goods.

Jerome Tire Co., September 20 (New York), $10,000. D. J. Gutman, 1269 Broadway; A. A. Jacobs, 570 West 156 street; J. C. Robb, 389 Third avenue, all of New York City. To manufacture rubber tires, tubes, etc.

Kent, L. P., & Co., August 25 (New York), $100,000. L. P. Kent, president; B. W. Guernsey, treasurer; T. A. Clements, secretary. Principal office, 2 Rector street, New York City. To act as import brokers in crude rubber and tropical produce for Far Eastern accounts.

Maderite Rubber Products Co., The, August 30 (Ohio), $300,000. R. W. John; F. H. Kelsey; W. Eberly; J. J. Sloan. Principal office, 3962 East 93d street, Cleveland, Ohio. To manufacture tires and other rubber products.

Master Tire & Rubber Co., The, August 23 (Ohio), $200,000. C. L. Caffel; C. H. Stultz; R. S. Shuen; F. Coats; H. A. Estabrook. Principal office, Dayton, Ohio. To manufacture rubber tires and rubber goods.

Monarch Belting Co., The, August 18 (Ohio), $25,000. G. D. Frieze; H. J. and R. Kimpel; M. Miller. Principal office, 1270 Ontario street, Cleveland, Ohio. To manufacture and deal in leather and rubber products.

Nation-Wide Tire Stores, Inc., August 29 (New York), $10,000. D. C. Koupal, 544 West 145th street; W. M. Watson, 2783 Broadway, both of New York City. C. Bisgard, 130 Bay 32nd street, Brooklyn, New York. To manufacture automobile tires.

National Rubber Company of California, August 19 (California), $100,000. E. J. and M. R. Chambers; R. H. Watts, all of Long Beach; N. Molchan, Santa Ana; H. W. Mahan, Los Angeles, all of California. Principal office, Los Angeles, California. To deal in all kinds of rubber goods and merchandise.

Pacific Wheel & Rim Corporation, September 7 (Delaware), $600,000. H. K. and C. I. Hoch; M. E. Hothersall, all of Wilmington, Delaware; J. G. Richardson, Citizens National Bank Building, Los Angeles, California. Delaware agent, Delaware Incorporating Company, 900 Market street, Wilmington, Delaware. To manufacture automobile rims.

Plymouth County Shoe Co., August 21 (Massachusetts), $95,000. J. L. and I. Smith, both of 133 Boylston street, Brockton; H. J. Ferngold, 14 Brookview street, Dorchester, all of Massachusetts. Principal office, Brockton, Massachusetts. To manufacture boots, shoes, rubbers and wearing apparel.

Sanitary Comb Co., August 4 (New Jersey), $100,000. C. H. Bishop; W. S. Quigley; S. Van Dersal, all of Newark, New Jersey. Principal office, 389 Belmont avenue, Newark, New Jersey. To manufacture combs.

States Rubber Holding Co., The, August 4 (Ohio), $100,000. F. H. and B. F. Kelsey; C. A. Hope; L. A. Pickering. Principal office, Cleveland, Ohio. To manufacture tires, tubes and rubber goods.

Sunset Rubber Co., June 9 (Washington), $150,000. C. E. and S. A. Powley; W. A. Cloud. Principal office, Everett, Washington. To manufacture, buy and sell all descriptions of rubber products and compounds.

Tillinghast, B. C., Rubber Manufacturing Co., September 9 (New Jersey), $50,000. H. A. Black, 7 Vine street, New Brighton, Staten Island, New York; C. J. Skinner, 9 Rutgers avenue, Jersey City, New Jersey; W. J. Edelman, 609 W. 115th street, New York City. Principal office, 15 Exchange Place, Jersey City, New Jersey. To manufacture any and all kinds of rubber goods.

Tire Jack, J. D., Corporation, July 21 (New Jersey), $100,000. J. C. Fonday, 626 Bergen avenue; L. W. Leonard, 91 DeKalb avenue, both of Jersey City; G. C. Ashwell, Fair Haven, Monmouth County, all of New Jersey. Principal office, 15 Journal Square, Jersey City, New Jersey. To manufacture, deal, buy and sell all varieties of jacks.

United & Globe Rubber Corporation, September 12 (Delaware), $2,000,000. W. McK. Milner, Trenton, New Jersey; J. Green; H. Miller, both of Bethlehem, Pennsylvania. Delaware agent, S. D. Townsend, 927 Market street, Wilmington, Delaware. To manufacture and deal in rubber and all component parts thereof.

Vul-Tex Rubber Co., The, August 10 (Ohio), $300,000. G. W. Mers; M. Hoppers; R. and E. Burroughs; H. Herberich. Principal office, Barberton, Ohio. To manufacture sponge rubber and novelty rubber goods. (Reorganization of Electric Rubber Reclaiming Co.)

Weiner Tire Co., Inc., September 13 (New Jersey), $100,000. L. J. and M. Weiner, all of 1041 Clinton avenue, Irvington; W. R. Ecker, 24 Shepard Terrace; H. Silverman, 340 Central avenue, both of West Orange, all of New Jersey. Principal office, 1041 Clinton avenue, Irvington, New Jersey. To manufacture tires.

Witwer Battery Co., July 3 (Illinois), $500,000. H. T. Witwer, president; G. H. Keeley, vice-president and treasurer; F. M. Witwer, secretary. Principal office, 630 St. Louis street, Danville, Illinois. To manufacture and sell automobile and radio storage batteries.

Zane Tire & Supply Co., The, August 2 (Ohio), $10,000. W. H. Roberts; E. J. Downs; M. V. Mohn; E. R. Mayer; T. O. Crosson. Principal office, 30 North Fifth street, Zanesville, Ohio. To distribute automobile tires, accessories and storage batteries.

Zastrow Auto Service & Sales Co., June 20 (Wisconsin), 500 shares common stock par value $100 each. H. A., H. E. and E. Zastrow, all of 846 National avenue, Milwaukee, Wisconsin. Principal office, 846 National avenue, Milwaukee, Wisconsin. To buy, sell and deal in tires, accessories and supplies.

The Rubber Trade in East and South

Manufactured Goods

The current condition of all rubber manufacturing divisions is encouraging, due in large part to the virtual settlement of the railway and coal strikes. Transportation facilities are notably better in the East than in the South, where shortage of equipment prevents rapid handling of freight.

In mechanical lines production is at about 85 per cent of capacity greatly enlarged within recent years. This means nearly double the pre-war output of mechanicals at the present time. Rubber boot and shoe factories are working on large tickets for the coming inclement season. Without exception, the insulated wire mills are very busy and running full time. The same is true of those producing garden and other hose. The manufacture of jar rings is now virtually out of the seasonable class and is becoming an all-the-year-around proposition, so steady is the demand. Tire and tube output is being well maintained, although due for a considerable seasonal reduction to take place gradually during the balance of the year. Heel factories are very busy supplying the constant and active demand for goods. The same may be said of druggists' sundries, weatherproof clothing and automobile topping.

New York

Well known among Canadian manufacturers, Arthur L. Henthorn has been successively superintendent of The Crescent Machine Co., Montreal, Canada, a firm engaged in the manufacture of special rubber machinery, molds, etc.; and later with the Canadian Consolidated Rubber Co., Limited, as engineer at this company's eastern and Montreal factories. Resigning to come to Malone, New York, he built the plant of The North American Process Co. and brought the plant into production. While connected with the Canadian Consolidated Rubber Co., Limited, he was responsible for all engineering in connection with that organization's four plants, also serving in advisory capacity. He is an associate member of the American Society of Mechanical Engineers.

Arthur L. Henthorn

In order to supply the demand for its products, the R. T. Vanderbilt Co., Inc., 50 East 42nd street, New York, N. Y., is at present running its various plants at capacity. The organization specializes in rubber compounding materials, and reports that sales have doubled during the first half of 1922.

On October 1, The Gutta Percha & Rubber Manufacturing Company moved its executive offices to the Borden Building, 350 Madison avenue, at 45th street, New York, N. Y. In future all stock will be carried at the company's warehouses connected with the Brooklyn works, while New York city deliveries of goods will be made by motor trucks.

Officials of the Kelly-Springfield Tire Co., 250 West 57th street, New York, N. Y., report that their Akron and Cumberland factories are now running at full capacity, while the production of tires at the latter plant during the first seven months of this year was more than triple the amount manufactured during the corresponding period last year. Maurice Switzer is vice-president of the organization.

Stockholders of the Intercontinental Rubber Co., at a special meeting held in Jersey City, New Jersey, September 12, approved the financial reorganization plan for the creation of a new company known as the Intercontinental Rubber Products Corporation with a capitalization of 60,400 shares of no par value and an authorized issue of $2,903,000, 7 per cent, 10-year convertible collateral trust notes.

The firm formerly known as E. M. & F. Waldo has been changed from a partnership to a corporation, under the name of E. M. & F. Waldo, Inc., at 11 Broadway, New York, N. Y. A factory is maintained at Harman, Maryland, where a specialty is made of the production of basofor, blanc fixe, and various colors used in the rubber industry.

A change of name from Barnard-Lynah, Inc., to Barnard Co., Inc., 321 Broadway, New York, N. Y., is announced by officials of this corporation, which acts as a sales agent for cotton mills, particularly those making tire fabric. O. A. Barnard is president.

The Ideal Waterproof Fabric Co., Inc., recently moved from 443 Broadway to larger quarters in the Cable Building, 621 Broadway, New York, N. Y. This concern handles a full line of rubberized materials such as nainsooks, batistes, silks, percales, hospital sheetings, etc., and sells to manufacturers and jobbers of household and sanitary aprons, bibs, baby pants, bathing shoes, bathing caps, raincoats, etc.

Announcement is made of the removal of the offices of The Motor and Accessory Manufacturers' Association to the Fisk Building, 250 West 57th street, New York, N. Y.

Announcement is made by officials of The Advance Rubber Co., offices and factory at 21-39 Gardner avenue, Brooklyn, N. Y., of the recent appointment of Arthur Golden as assistant sales manager. This organization manufactures tires and tubes and various mechanical goods.

Pennsylvania

For the purpose of still further developing the business of the Quaker City Rubber Co., 624-628 Market street, Philadelphia, Pennsylvania, C. A. Daniel, president of the concern, announces the recent appointment of James M. Dixon and Norman E. Oliver as directors. Mr. Dixon is connected in an executive capacity with several large corporations, while Mr. Oliver was formerly vice-president of The B. F. Goodrich Co. and has a wide experience in the rubber industry.

Although solvent, The Hydro-United Tire Co., Inc., Fourth and Hanover streets, Pottstown, Pennsylvania, recently passed into receivership, an equity proceeding to conserve the firm's assets. Officials of the organization state that business is steadily growing, and that under the new conditions they are better able than ever before to proceed with the manufacture and sale of their products. A. V. Tisdale is sales manager, and John Hill and Ephraim Lederer are receivers.

Due to increasing business the Morse Chain Co., Ithaca, New York, has found it necessary to secure larger and more commodious quarters for its Philadelphia offices, at 612 Franklin Trust Building, 18-22 South 15th street, Philadelphia, Pennsylvania, with J. A. Meaney in charge as district manager.

The Vulcanized Rubber Co., Morrisville, Pennsylvania, is being operated overtime to fill orders for pipe stems and other hard rubber products.

Southern Notes

The Tirometer Valve Co., Charleston, West Virginia, has broken ground at Salisbury, North Carolina, for a new plant where a tire valve having certain improved features will continue to be manufactured. The concern's output has been taken over by The Paul Rubber Co., also of Salisbury, North Carolina, whose products include inner tubes and rubber specialties. M. W. McConnell is president of the last-mentioned organization.

Press reports state that between 150 and 200 cotton mills will be represented this year at the second Made-in-Carolinas Exposition, to be held September 25-October 7, at Charlotte, North Carolina. Several tire yarn and fabric mills will display their products on this occasion.

The largest finishing plant in the South, the Union Bleachery, at Greenville, South Carolina, has twice doubled its capacity since its establishment in 1902. In the most recent plant development the drying machines and calenders, as well as tentering machines, were supplied by H. W. Butterworth & Sons Co., Philadelphia, a firm specializing in tire fabric drying machinery.

Additions have been recently made at the plant of The Paul Rubber Co., Salisbury, North Carolina, while production is to be increased to 5,000 tubes daily. Inner tubes equipped with Tirometer valves represent one of this company's specialties. R. B. Tracy is director of sales.

The Electric Hose & Rubber Co., with general offices and plant at Wilmington, Delaware, is now operating at full capacity. A night force is at present being put on in order to build up the factory production to 2,500,000 feet of rubber hose monthly.

The Goodyear Tire & Rubber Co., Akron, Ohio, has appointed J. W. Paulin manager of its branch in Louisville, Kentucky.

MEETINGS OF THE NATIONAL WASTE MATERIAL DEALERS

The quarterly meetings of the National Waste Material Dealers were held at Hotel Astor, New York, N. Y., September 19 and 20. Plans were discussed for the establishment of an exchange where members can buy and sell waste materials of various kinds. The establishment of such an exchange will depend on recruiting 50 members from the association membership to join the exchange.

It was determined to publish for distribution to users of scrap materials, a year book commemorative of the tenth anniversary of the organization of the association.

Much business of a routine character was transacted. A total of 58 members and guests attended a luncheon at the Astor, preceeding the general meetings.

The Rubber Trade in Rhode Island

With the adjustment of labor difficulties, both national and local industries are settling into the harness, and plants that have been idle or partially so for months are beginning to assume an air of activity. Every one is optimistic that in a comparatively short time a condition approaching normalcy will obtain. The rubber industry is in the running with others and in Rhode Island the beginning of the last quarter of the year finds the situation bearing all the appearances of improvement. From all component parts of the industry here, reports indicate a larger volume of business than has been enjoyed for a long time, while the outlook is very encouraging. Stocks of all kinds have been generally depleted by the curtailment of manufacture and buying so that any appreciable increase in demand by the purchasing public will make itself felt almost immediately at the plants. Some managements are even optimistic enough to declare that they believe the coming year will be one of the busiest the rubber factories of this state have had in several years and are making quiet preparations to meet such a condition.

The resumption of making operations at the National India Rubber Co.'s plant at Bristol, Rhode Island, on August 28, after a month's shut-down has been followed by a gradual increase in the number of operatives in the several divisions. During the shutdown an account of stock was taken and extensive repairs and renovations were made in and about the plant. Indications are favorable for an unusually busy season that is expected to continue throughout the winter. The last few weeks have revealed a considerable increase in orders received and it is expected that there will be further additions to the working forces in the immediate future and there are rumors of the addition of another line of work after the first of the new year.

It is understood that the making ticket in the keds division, upon resumption, called for a daily output of 36,000 pairs of shoes

with every prospect that the ticket would be increased as the season progresses. This outlook was speedily verified in the gradual and steady increase made in the number of operatives since the plant started, and there is a very decided atmosphere of optimism and encouragement prevalent in all departments of the establishment.

Many rumors have been in circulation, since the resumption of the plant, that it was for only a limited production and that the factory would undoubtedly shut down at a later date for an indefinite period. But according to a statement made by Edward I. Cooper, factory manager, the prospects are bright for an increase in business this fall that will keep the plant running for some months to come. Mr. Cooper also pointed to the fact that additional hands are constantly being taken on in the stitching department and that it is probable that more will be hired at an early date. He further states that conditions were apparently never so promising as at the present time.

The Revere Rubber Co. reports a good business with some excellent orders booked that will keep things moving briskly for some time to come. During the past few weeks the company has been calling for girls, both experienced and learners, for its various departments.

The United States Rubber Co., gets an increase of about $500,000 in the valuation of its property holdings in Providence, according to the assessment of the Board of Assessors filed the past month with the City Treasurer for collection. The valuation is jumped from $3,744,540 last year to $4,248,540 this year. Among the individuals, firms and corporations assessed upon a valuation of $50,000 or more are the following identified or affiliated with the rubber industry: American Emery Wheel Works, $350,780; American Multiple Fabric Co., $117,580; Joseph Banigan Estate, $1,110,480; Augustus O. Bourn, $96,140; Bourn Rubber Co., $292,580; M. E. Davol, $530,700; Davol Rubber Co., $627,100; Glendale Elastic Fabric Co., $217,300; Mechanical Fabric Co., $118,800; New England Butt Co., $259,940; Eugene R. Phillips, $56,500; Providence Rubber Co., $686,000; Revere Rubber Co., $262,200; Rhode Island Hospital Trust Co., trustee under will of Joseph Davol, $391,600; Textile Finishing Machinery Co., $689,500; Samuel P. Colt Estate, $140,000; Walker Webbing Co., $102,020.

The Consumers' Rubber Supply Co., 78 Broadway, Providence, Rhode Island, is being conducted by Roy A. Johnson and James A. Doherty, according to their statement filed at the office of the city clerk.

Romeo A. Bonin, 63 Bernice street, Woonsocket, has filed a voluntary petition in bankruptcy in the United States District Court for Rhode Island, giving his total liabilities as $20,567 and his assets as $1,040. Among the largest creditors are Tyer Rubber Co., Andover, Massachusetts, $6,732; The Star Rubber Co., Akron, Ohio, $1,353; Penn Rubber Co., Boston, Massachusetts, $1,129; Wayne Pump & Tank Co., Ft. Wayne, Indiana, $990; The Firestone Tire & Rubber Co., Providence, Rhode Island, $1,523 and George Grow Tire Co., Boston, Massachusetts, $327.

The Rubber Trade in New Jersey

Manufactured Goods

The surprisingly active demand for the products of Trenton rubber factories still continues. This statement holds true of all lines of rubber goods manufactured locally, and must be taken as testimony of the satisfactory values and excellent qualities of Trenton-made rubber goods. Many shrewd buyers for the largest purchasers of rubber products have reached the conclusion that the combination of price and quality obtainable from several of the Trenton mechanical rubber goods factories is hard to match in other markets. This fact together with prompt service has contributed greatly towards the upbuilding of Trenton's rubber business, and the retention by its rubber manufacturers of both old and new trade.

Empire Sold and Reorganized

The plant and all assets of the Empire Tire & Rubber Corporation, Trenton, New Jersey, were sold, on September 13, to Campbell, Heath & Co., 5 Nassau street, New York, N. Y., for $1,675,000. At that time plans were also made for the organization, under the laws of the State of New Jersey, of the Murray Rubber Co., with the following as officers and directors:

DIRECTORS

William H. Peck, president of the Third National Bank of Scranton.
H. J. Angermeier, vice-president of the National Bank of Kentucky.
W. D. Campbell, president of the Van Camp Packing Co.
W. M. Pepper, treasurer of Campbell, Heath & Co.
C. E. Murray, Jr.

OFFICERS

C. Edward Murray, Jr., president and general manager.
William M. Pepper, vice-president and treasurer.
Harvey R. Nason, secretary.
Ray H. Paddock, manager Tire Division.
Robert M. Stuart, manager Mechanical Goods Division.
W. W. Sanders, factory manager.
Albert N. Alexander, comptroller.
H. Earl Berrien, assistant treasurer.
Norman S. Conover, assistant secretary.

The above executive personnel is identical with that which has been running the plant successfully during the recent receivership, while C. Edward Murray, the new president, represents one of the receivers. The list of district managers also remains practically unchanged.

The manufacture of Empire tires and tubes and mechanical goods will be continued as in the past, with the Murray products in addition. Executives of the new organization state that the Murray Rubber Co. will be simply a new corporate name.

Trenton

The next meeting of the Rubber Manufacturers' Association of New Jersey will be held on October 9. A large attendance is looked for, and the president, Charles E. Stokes, is preparing an interesting program looking towards social enjoyment as well as business matters of interest to the membership. This is in accordance with a resolution passed at the last meeting of the association. It is likely that some matters of general interest to the trade at large will be discussed at this meeting.

Captain Ernest Buckleton, well known to the rubber trade of the United States, and particularly to local manufacturers, is expected to arrive in Trenton next month. Captain Buckleton served in the World War in the British Army and was wounded at the Battle of the Marne and later at Ypres. He is now engaged in the crude rubber business in London and also represents a large United States manufacturer of reclaimed rubber.

The Acme Rubber Manufacturing Co., is still operating overtime in several departments. It reports a volume of business almost equalling the high production mark of the year, with every prospect of so continuing for some time.

The Thermoid Rubber Co., Trenton, reports business good in all departments. The plant is running full time and by eliminating night work it is hoped to give all the regular employes steady work all winter.

The United & Globe Rubber Co. and the Globe Rubber Tire Corporation, Trenton, have good prospects for the coming winter months with all departments running to full capacity at the present time.

The Hamilton Rubber Manufacturing Co. is finding business a little slack as the result of the railroad strike. The company has many orders to fill when shipping conditions become better.

The Empire Tire & Rubber Corporation is unable to fill many orders on time and prospects were never better. The company has an unusually large number of orders for garden and fire hose, while the tire department is being operated by three shifts.

The Bergougnan Rubber Co., is constantly increasing its daily output, which at the present time is on an average of from 300 to 400 tires and tubes per day, and is somewhat behind on orders. The curing department of this company is operating twenty-four hours per day while in the mill departments two shifts are employed. Jean Grenier, vice-president of the company, states that the company is in need of additional machinery, especially vulcanizers, and these will be installed within a short time. He also states that the future for the tire trade looks very bright when conditions generally become normal.

Horace B. Tobin has returned from an extended tour of England, France, Switzerland and Italy, and has resumed charge of the affairs of the Woven Steel Hose & Rubber Co.

E. B. Fulper, president of The American Oil & Supply Co., who accompanied Mr. Tobin on his European tour, has also returned home, and reports a very satisfactory volume of business during his absence. His company handles a number of lines of rubber manufacturers' raw materials, especially mineral compounds.

The affairs of the Semple Rubber Co. are still in the hands of J. V. B. Wicoff, who was appointed receiver some time ago. Mr. Wicoff has not as yet made any report to the United States District Court.

Harry L. MacGregor, former official of the Globe Rubber Tire Co., Trenton, who was indicted with Herbert W. Kugler, former president of the concern, for embezzlement, was returned to Trenton on September 10, and is held under $20,000 bail for his appearance before the Mercer County Grand Jury.

The Eureka Tire Co., will hereafter manufacture cord tires only. The regular line will be giant oversize and extra ply.

D. Lane Powers has severed his connection with the Trent Rubber Co. and has become actively engaged with the Eureka Tire Co., of which he is president.

New Jersey Notes

The Manhattan Rubber Co., Morristown, New Jersey, is installing new machinery in the reclaiming department. It will require about three months to complete the work. Meanwhile reclaiming on a small scale is in progress, while the crude rubber mill is working to capacity. More rubber is being turned out at the Manhattan plant at present than at any time since the factory was built.

The Lambertville Rubber Co., Lambertville, New Jersey, has opened a new department for the manufacture of tennis shoes. The company has already booked a number of orders and is expected to be kept busy during the coming winter supplying the demand for indoor tennis shoes. A force of sixty hands has been started in the new department.

The Maywald Rubber Co., Nutley, New Jersey, manufacturer of gloves, tubing, etc., reports that sales for the first six months of this year were greater than for the entire twelve months of last year. Extensive additions to the plant are now being made while the company's capitalization has been recently doubled. A larger line of rubber goods will be manufactured. Frederick J. Maywald is president.

The Armstrong Rubber Co., Inc., Garfield, New Jersey, has recently begun an addition to its plant in consequence of the increasing demands for the company's cord truck tires. G. F. Armstrong is president, and J. A. Walsh is secretary.

REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients."

The Rubber Trade in Massachusetts

Manufactured Goods

Settlement of the coal strikes and the receipt of large shipments of English bituminous coal have made unlikely any rubber factory shut-downs. Most plants were well supplied. New England railway maintenance forces have been almost fully manned for several weeks, and no serious delay in shipments has occurred.

Most Massachusetts rubber plants are busy, although spotty business is reported here and there. Rubber footwear plants are operating on large tickets, and tire demand is holding up surprisingly well. Mechanical goods production is now very near normal, belting and hose lines showing considerable improvement. Heel manufacture and consumption shows steady increase, and the growing popularity of sport shoes is reflected in the call for rubber and fiber soles. Brisker business is reported in clothing lines and druggists' sundries. Dealers' stocks had become depleted and are being replenished. Insulated wire and auto topping continue in good demand. Most reclaimers are investigating various new uses for their product and announcements of their entry into the field of rubber goods manufacturing are to be expected. A slight increase in hard rubber radio parts is being noted, though this market is not developing as rapidly as had been expected.

Statistics of Rubber Manufacture

Rubber goods amounting to $130,666,028 represented about one-thirtieth of the value of the manufactures in Massachusetts for the year 1919, according to the 34th annual report of the Director of Statistics, which has just been published. Substantial gains over the previous year are shown, and the state still maintained its leading position in the manufacture of rubber boots and shoes.

Eight establishments with an invested capital of $43,582,806 using stock and materials valued at $17,621,139, and paying wages amounting to $12,762,706 to an average of 13,062 wage earners, produced rubber boots and shoes to the value of $44,307,961.

Forty-seven establishments with an invested capital of $64,522,117, using stock and materials valued at $47,627,882, and paying wages amounting to $11,538,080 to an average of 9,600 wage earners, produced other miscellaneous rubber goods to the value of $86,358,067.

The total value of rubber goods exports is not stated, but 11 establishments selling rubber products exclusive of rubber boots and shoes exported goods valued at $2,248,118.

Although most of the rubber footwear is produced in or near Boston, many of the miscellaneous rubber products are manufactured elsewhere in the state. In metropolitan Boston five establishments, with an invested capital of $30,200,220, using stock and materials valued at $14,712,656, and paying wages amounting to $11,332,853 to an average of 11,384 wage earners, produced rubber boots and shoes to the value of $39,070,709. Miscellaneous rubber goods to the value of $22,281,886 were produced by twenty establishments with an invested capital of $12,616,299, using stock and materials costing $8,507,609, and paying wages amounting to $2,454,233 to an average of 2,473 wage earners.

The total rubber goods production of metropolitan Boston was therefore $61,352,595, or about 47 per cent of the total for the state.

Boston

Increasing autumn demand for waterproof clothing has necessitated doubling production by the Clifton Manufacturing Co., Jamaica Plain, Massachusetts. Salesmen went out with a complete new calendered rubber clothing line on September 15.

The Graphic Arts Show, held in Mechanics' Building during the last week in August, was probably the largest and most

comprehensive exposition of the printing and allied trades ever held in the United States. The dependence of the modern printing art upon rubber was conspicuous in most of the many and varied machines shown in operation. Feed roller faces of both presses and folding machines were largely of rubber. Pneumatic feeding devices on presses and book binding machinery utilized considerable quantities of rubber hose, while rubber blankets were seen on all offset printing presses.

At a recent meeting of the directors of the Franklin Rubber Co., manufacturer of rainproof and rubber goods, 134 Federal street, Boston, Lorin L. Fuller was elected treasurer to fill the vacancy caused by the death of his father, Everett L. Fuller, who died recently. November 1 will be the fortieth anniversary of the company, the business having been started in 1882 by Fuller, Leonard & Small at 13 Franklin street. Of the original founders, Mr. Small is the only one now living, although he retired from the firm three years ago.

Massachusetts Notes

Owing to increasing demand for its footwear, the Firestone-Apsley Rubber Co., Hudson, Massachusetts, has adopted plans for extensive improvements and alterations in plant lay-out as well as the installation of considerable new equipment, including better lighting and water supply. By insuring a steady flow of materials from one department to another, thereby eliminating lost time, plant capacity is being increased 32 per cent with no increase in floor space. Better working conditions, greater individual efficiency, and more economical production will result.

The Avon Sole Co., Avon, Massachusetts, which claims to have originated the fiber sole in 1912, has increased its plant capacity about 125 per cent. Although several million pairs of fiber sport soles were made by the company during the past eighteen months, production was not equal to demand. A plain fiber sole is also made for general wear. Recently the firm has engaged in the manufacture of vulcanized crêpe rubber soles, both in natural amber color and red. These soles can be stitched to the shoe, they wear well and will not "squash" or roll up in the center.

Robert A. Burns, formerly sales manager of the Walter M. Lowney Co., of Boston, is now with the sales department of the Hood Rubber Products Co., Watertown, Massachusetts.

The Needham Tire Co., Charles River, Massachusetts, which was petitioned into bankruptcy in March of this year, is still in the hands of the receivers, John Wells Farley, W. Rodman Peabody and John H. Sturgis. An effort is being made to place the business in the hands of a trustee in order that it may be offered for sale. Meanwhile the plant is not in operation. Tires and tubes, the first product of the company, were discontinued a few years ago, and the company specialized on Wids heels and soles.

The Converse Tire Co., Malden, Massachusetts, is operating two shifts daily on Converse cords and will materially increase production for the month of October.

The Converse Rubber Shoe Co., Malden, Massachusetts, is now very busy in its rubber shoe departments, and reports large orders from the West, where early cold and wet weather has stimulated the retail trade. A huge electric sign 150 feet long and 12 feet high is being erected on the factory roof, where it will be read every evening by thousands of motorists driving along the Fellsway nearby.

The four plants of The Panco Rubber Co., at Stoughton and Chelsea, Massachusetts; Sherbrooke, Quebec; and Trenton, New Jersey, are now running at full capacity. Sales of soles and taps are averaging about 50,000 gross annually, while the rubber heel output is 125,000 pairs daily. Officials of the company state that business for this current year will be much larger than even that of 1921 by a very substantial percentage. H. J. Lucier is controller.

The Phillips Rubber Co., 10 High street, Boston, Massachusetts, recently moved its factory to 38-45 Main street, Cambridge, Massachusetts, where increased space and new equipment will enable the company to meet present and future needs more easily. Demands for molded mechanical goods, upon which the company specializes, have greatly increased during the last six months. Carl Maynard, formerly with the Revere Rubber Co., has joined the executive staff.

An increase in capitalization from $1,200,000 to $1,400,000 has been made recently by the Salmon Falls Manufacturing Co., 50 State street, Boston, Massachusetts. The company has adopted this policy in order to increase more efficiently and extensively the development of water power at its tire fabric mills in Salmon, Falls, New Hampshire. Ronald T. Lyman is treasurer of the organization.

The Rubber Trade in Ohio

Manufactured Goods—Akron

The reopening of the Ford Motor Co. plant did not immediately result in an increase in production of tires at the Goodyear Tire & Rubber Co., which stood alone in having curtailed production when the Ford shutdown came. The other factories had continued operations on a normal basis and the reopening of the plant affected them comparatively little. Most of the companies which do a Ford business had no difficulty in diverting the casings, which ordinarily would have gone to Ford, to dealers' channels, or to stocks which have been seriously depleted during the past few months because of the unexpected increases in demand for tires at a time when curtailment in demand was expected.

Dealers' business is expected to drop off during the coming month. That the seasonal decline must come soon is generally believed because it has held off more than three months now. At the present time, however, dealers' orders continue at a rate which will warrant present production for at least another month.

The sale of mechanical goods has shown increases during the entire year. This is also true for the present month and all indications point to a continuance during the next few months. Mechanical departments are operating at very close to normal, principally belting and hose. Heel production has constantly increased and a new high record will be made in this line this year. Druggists' sundries sales have shown constant increases. The stocks throughout the country were exceedingly low and dealers have found it necessary to build them up. Boots and shoes have moved rapidly and departments are practically at normal production. The B. F. Goodrich Co. has enjoyed a large business on the new "Pavlovo" galosh which was placed on the market last season. Sale of four-buckle arctics has been better than was expected and these departments will continue to operate at very close to capacity. The increasing demand for radio telephones has made for better business in the hard rubber department, although it is doubted if the demand for parts will be as large as was anticipated last year.

Modification of Spring Dating Recommended

The policy of extending the so-called "spring dating" to automobile tire dealers in southern and warmer states is entirely fallacious and should be stopped for the good of the dealers as well as the manufacturers, according to William O'Neil, vice-president and general manager of The General Tire & Rubber Co.

"The so-called spring dating idea was evolved to insure even production in the factories during the normally dull months in the industry," Mr. O'Neil states. "In the northern states cold weather and snow make it impossible to use tires during the winter months. The dealers, unless given some inducement to purchase tires during these months, would certainly not buy stocks during the cold months. Therefore, manufacturers gave dealers who ordered goods during the cold months "spring

dating" on their accounts, payable April or May 10. In this way dealers were assured of tires when the motoring season opened, and production continued on a comparatively even keel in the factories.

"However, this practice does not mean anything in the south where the motoring season runs twelve months. Why should any dealer be given five and six months to pay for the tires which he sells during the winter months just as rapidly as he does during the summer months?

"The northern dealer cannot turn his stock into cash and for that reason the practice is a very good one. But I am in favor of abolishing this dating in the states which do not have extremes of hot and cold weather, and will make this proposal to the tire manufacturers generally in the very near future," Mr. O'Neil says.

Rubber Machinery Manufacturers Optimistic

The manufacturers of rubber machinery and equipment in the entire Akron district feel encouraged over the better business which has obtained during the past six months and the prospects which are now in view for the future. While improvement in many instances has been spotty the tendency has been constantly upward.

The Akron Standard Mold & Machinery Co. has just completed a $20,000 addition which will add more than 50 per cent to the factory floor space. The new addition is for making mechanical molds into the production of which the company has just entered. The entire factory has been working to capacity for several months with no let up in sight at the present time. The Bridgewater Machine Co. reports that indications point to a constantly increasing business. The Adamson Machine Co.'s operations are above an average of 60 per cent. The foundry continues to be somewhat busier than the machine shop. The Akron Equipment Co. plant is at better than 75 per cent of capacity on replacement business, while new business is increasing. The Akron Rubber Mold & Machinery Co. is running full time, with the engraving department operating three shifts a day. Most of the new business originates outside of Akron and is characterized by customers "wanting the equipment the same day it is ordered." The Vaughn Machinery Co., of Cuyahoga Falls, Ohio, has just received from a large corporation in Oregon an order for new equipment with an initial capacity of 500 tires a day. The Franz Foundry & Machine Co., of Barberton, Ohio, has enjoyed one of the best summers in the history of the company, although a slight falling off of orders has occurred during the past few weeks.

Akron

The General Tire & Rubber Co. is planning to double production capacity at an expense of $200,000. Present production is in the neighborhood of 2,000 tires a day. The company will show a material increase in business over last year, as well as in surplus and cash accounts in a forthcoming statement which will be issued for the first three-quarters of the company's year.

C. A. Myers, superintendent of engineering at The Firestone Tire & Rubber Co., has returned from a two months' trip in Europe. Conditions, as far as employment is concerned, were better in Germany than in most of the other countries he visited, while unemployment in England was greater than in all the rest of Europe. French conditions are showing some improvement. Holland, Switzerland and Scotland are in very good shape as compared with the other European States.

The Mason Tire & Rubber Co. is now producing more than 4,000 tires a day with every possibility of its new plant, the former Owen Tire & Rubber Co., going to 1,500 a day within a month, giving the company a total output of more than 5,000 tires a day. Sales during August were the largest in the history of the company, totaling more than $1,100,000, and pointing to more than $11,000,000 worth of business during the year.

The P. E. Welton Engineering Co. has been organized and incorporated for $50,000 under Ohio laws to take over the assets and business of the Akron Engineering Co., of which P. E. Welton was president. The new company will continue its work of building and managing new rubber companies and announces that contracts for two new plants have been practically completed.

The Philadelphia Rubber Works Co., rubber reclaimer, anticipates that the coming year will show a material improvement over the present. Demand for reclaimed has shown some increase. At present plant operations are at better than 50 per cent of normal.

William Pfeiffer, secretary and treasurer of The Miller Rubber Co., has gone to Europe for a two months' trip, and will devote the major part of his time to a study of conditions in Germany and England.

Production of The Miller Rubber Co. continues to be high. Druggists' sundries business is reported very good. The playball demand has grown larger and is requiring increases in equipment.

The Kelly-Springfield plant at Akron is now running to capacity with production in the neighborhood of 1,900 pneumatic tires, 400 solids and 1,800 inner tubes a day. Every indication points to a continuance of this production schedule into the winter.

Executives of The General Tire & Rubber Co., Akron, Ohio, state that the present year has been the busiest one both in units and dollars in the history of their organization. Recent items of interest in connection with the company include the opening of a new agency at 1314 Broadway, Nashville, Tennessee, and the appointment of R. E. Parker as resident representative of the company at Portland, Oregon. R. P. Lyman has been transferred to California where he will have charge of San Luis Obispo territory.

For the past three months The India Tire & Rubber Co., Akron, Ohio, has been operating night and day with a daily production of 600 casings and 800 tubes.

A two-story rubber reclaiming plant at North and Furnace streets, Akron, Ohio, was completely destroyed by fire of unknown origin on September 6. The Leo Meyer Co., which has been running the plant, estimates the loss at $100,000.

L. C. Rockhill, sales manager of The Goodyear Tire & Rubber Co., Akron, Ohio, recently completed fifteen years of service with that organization. For seven years he held the position of manager of automobile tire sales.

According to the Firestone News Service, the production of tires in Akron alone for March, 1922, exceeded 1,500,000, a figure much greater than that for March, 1921, which represented the total tire production of the United States as being 1,163,000 for that month.

The R. J. Caldwell Co., with main offices at 15 Park Row, New York, N. Y., announces the opening of an office at 602-603 Flatiron Building, Akron, Ohio, with C. M. White, Jr., in charge. Mr. White was formerly the general sales manager for the Firestone Steel Products Co.

Russell Farley, formerly purchasing agent of The Marathon Co., has engaged in the sale of pigments, chemicals and other supplies for rubber factories at the office of the Rubber Engineering Co., 712 Second National Building, Akron, Ohio.

The Mohawk Rubber Co. has experienced a considerable increase in export business during the past few months. This is showing a 10 per cent monthly advance at the present time, largely in the Scandinavian countries.

The pneumatic tire business of the Swinehart Tire & Rubber Co. has shown a remarkable increase during the past two months,

while its truck tire sales have also gained. The factory is running with three shifts a day in some departments and with two shifts a day in all others.

The Western Reserve Rubber Co. has added several new novelties during the past month. For the first time the company has attempted to make rubber "squawker" goats and cats. These new productions have found favor with the trade and orders are large. Business is very good with bright prospects for the Christmas trade.

L. J. Schott, president of The Amazon Rubber Co., has resigned and has been temporarily succeeded by Claude E. Dettler, for several years secretary of the company.

The past two months have been the best in the history of The Star Rubber Co., and the factory has operated at three shifts a day during the entire period. Announcement is made that P. M. Dean, formerly with the Firestone Tire & Rubber Co., has joined the sales department and has been assigned to Illinois.

The Trump Rubber Co. has started production of the new "Trump Cord" tires. The present plant capacity is limited and larger production will be delayed until a new building which is contemplated has been equipped. The production of rubber belts is maintained at 35,000 a day, with radio parts business showing a healthy increase.

Ohio Notes

The Lambert Tire & Rubber Co., Barberton, is preparing to double production of cushion tires for the second time this year. The foundations for a new addition are already completed and the construction of the superstructure will be started within the next few weeks. The company will have a capacity of more than 350 tires a day when the new equipment is operating.

W. E. McCormish, for the past year general manager of the American Rubber Corporation, at Niles, Ohio, has severed his connection with the company. Thus far he is devoting his entire time to the management of the Rubber Engineering Co., of Akron, of which he is the head.

A. J. Howe, formerly office manager of The Marathon Co., Cuyahoga Falls, has succeeded Russell Farley in the purchasing department, assuming the new duties in addition to those he already had.

The Standard Tire & Rubber Co., Willoughby, Ohio, is manufacturing and selling the largest number of tires in its history. The company has shown an increasing business during the past six months.

E. L. App, for several years connected with the rubber industry in various capacities, has been named sales manager of the Excel Rubber Co., Wadsworth, Ohio. While production has not been increased materially since the receivership was lifted, the company expects to maintain present production. Orders for belts are increasing.

The Rote Leather Products Co. has been incorporated for $1,000,000 under the laws of Delaware to take over the plant of the Doyle Tire & Rubber Co., between Crumroy and Myersville, Ohio, for the purpose of manufacturing leather substitutes from a combination of leather and rubber. The company is headed by B. W. Rote, formerly of Akron but more recently of Cleveland. The secretary and treasurer is F. W. Hildebrand, also of Cleveland.

In order to keep in closer contact with factory operations The New Tread Tire Co. has removed its offices from Columbiana to East Palestine, Ohio. The company's executives include S. W. Tidd, president, and E. P. Altenburg, general manager.

New appointments of executives of The Falls Rubber Co., Cuyahoga Falls, Ohio, include: G. D. Kratz, sales manager; Fred H. Comey, factory superintendent; and Charles Wattleworth, assistant superintendent. The company specializes in the manufacture of "Falls" tires and "Evergreen" tubes.

The plant and assets of the former Apollo Tire & Rubber Co., 3962 East 93rd street, Cleveland, Ohio, have been taken over by a recently-formed corporation, known as The Maderite Rubber Products Co. The manufacture of tires will be continued by the new organization, whose executive personnel includes: R. W. John, president; W. V. Sleek, vice-president in charge of sales; R. F. Manning, secretary and service manager; and E. J. Ernst, factory manager.

The C. J. Tagliabue Manufacturing Co., with main offices at 18 to 88 Thirty-third street, Brooklyn, New York, reports the return from Europe of A. R. Anderson, sales engineer. Mr. Anderson will resume his duties in the Akron district with headquarters at 462 Hippodrome Building, Cleveland, Ohio.

The Rubber Trade in the Midwest

Midwest Rubber Manufacturers' Association

A well attended regular monthly meeting and luncheon of the Midwest Rubber Manufacturers' Association was held on September 20, at the Hotel Morrison, Chicago, Illinois. In the absence of the president, W. W. Wuchter, the vice-president, Thomas Fallen, of the Lion Tire & Rubber Co., La Fayette, Indiana, presided.

In discussing the tire situation it was said that the large amount of tires now being marketed at cut prices is harming the tire trade. Several small manufacturers are now selling tires at a loss while others are adopting the deplorable policy of using cheap fabrics and otherwise weakening their tire constructions to produce goods at a low price. It was predicted that the small manufacturers would gradually come to a cash sales basis and also calculate costs by a poundage method in order to secure accurate results.

C. D. Hardy, principal speaker at the meeting, considered the present readjustment in industry, agriculture and commerce and the return of prices to proper levels.

J. M. Baskin, of the New York *Daily News Record,* referred to the fact that clothing manufacturers and retailers are experiencing a falling off in trade due to the growth in popularity of automobiles which disposes the motorist to spend money for automobiles and their upkeep rather than on clothing.

The suggestion was made that association meetings be held in other cities than Chicago but definite action on this matter was deferred until the October meeting.

Midwestern Notes

The Krippendorf-Tuttle White Cliffs Products Co., 30 North Michigan Boulevard, Chicago, Illinois, which owns and operates what is said to be the largest chalk whiting plant in the United States, has completed the installation of new machinery for the production of 300 tons daily. An increasing demand is reported for "K-T" chalk whiting which is said to be equal to English cliffstone. Calvin Stitt, who is well known in the rubber industry, has been appointed general sales manager of the Krippendorf-Tuttle company.

About a year ago the plant and assets of the Dry Climate Tire Manufacturing Co. were taken over by The Mid-West Tire Manufacturing Co., with factory and general offices at Arvada, Colorado. Since then two additions to the plant have been built and new machinery has been installed, thereby increasing the capacity to five hundred tires and fifteen hundred tubes daily. The executive personnel includes the following: Charles W. Clark, president; Ford S. Taft, secretary and treasurer, and J. W. St. Clair, factory superintendent.

The Iowa Cord Tire Co., Inc., 24th and Scott streets, Des Moines, Iowa, has recently installed new machinery and equipment, while the plant capacity has been increased to 1,500 tires a day. The company is capitalized at $4,500,000.

The Sponge Tire & Rubber Co., Red Wing, Minnesota, which began production January 1, 1922, is now turning out 500 tires a day in three shifts. Present plans include an extension to the factory, in order to take care of increasing business. George N. Graham is general manager.

Although a friendly receiver has been appointed for The Majestic Tire & Rubber Co., Indianapolis, Indiana, production at full capacity is being maintained at the plant, where "Majestic" tires and inner tubes for small cars are being manufactured. Continually increasing business recently necessitated an enlargement of the factory. Reilly C. Adams is receiver, and H. M. Bradford, formerly superintendent of production, will continue as manager for the receiver.

The Yale Tire & Rubber Co., New Haven, Connecticut, manufacturer of tires and tubes, announces the appointment of M. P. Trout, who will cover city territory in Indianapolis, Indiana, working through the company's Indianapolis branch, of which M. E. Majors is manager. With headquarters at the same branch, Karl S. Moore will attend to Western Indiana territory.

The Goodyear Tire & Rubber Co., Inc., Akron, Ohio, has recently opened a branch at Sioux Falls, South Dakota, with H. D. Updike in charge.

The Allis-Chalmers Manufacturing Co., Milwaukee, Wisconsin, is building an addition, measuring 175 by 400 feet, to its plant known as the West Allis Works. On its completion about January 1, the factory formerly known as the Reliance Works will be closed, and is now being offered for sale.

Rubber Trade on the Pacific Coast

Manufactured Goods

Brisk sales of solid and pneumatic tires for trucks were a notable feature of the rubber business on the Pacific Coast during September, and the impression is that the demand will be sustained until late in the year. Numerous mines having been reopened, a good demand has developed for belting, packing, hose, and various mechanical rubber goods for replacement and for new extensions. Druggists' sundries are running rather slow, but an improvement is due next month. Heavy deliveries of rubber shoes ordered last spring are being made, and some novelties in cloth-topped, leather-trimmed, rubber-soled sport shoes as well as strapped bathing sandals are being introduced to the trade for 1923 wear.

Los Angeles

A marked improvement in sales over the corresponding period in 1921 is reported by F. R. Carroll, manager of the Los Angeles branch of The B. F. Goodrich Rubber Co. Mr. Carroll directs all Goodrich and Diamond operations in Southern California, Arizona and New Mexico, and the Yokohama Rubber Manufacturing Co. in Japan. For three years prior to 1921, he was in Japan as vice-president of the Goodrich concern there, supervising the output of a full line of tires and mechanicals.

Production at the Goodyear company's Los Angeles plant is running strong, even though somewhat under the peak record of 4,666 tires and 5,306 tubes turned out on August 18. The highest previous score was 4,076 tires and 5,000 tubes made on August 12, 1921, according to H. E. Blythe, superintendent.

A recent report shows that on March 1, 1921, the company's deficit was $3,157,762; on January 1, 1922, $1,672,453; and on June 1, 1922, $1,224,658.12. Cutting of tire prices of late, however, may prevent much further reduction in deficit during the remainder of this year. Earnings during the first six months of this year are said to be almost $500,000; current liabilities reduced from $538,935.63 to $473,477.74; current assets increased from $7,045,952.56 to $7,998,345.43. The deferred charges carried in the assets column on March 1, 1921, at $900,000 were $553,141.24 on January 1, 1922, and on June 1 last, $346,077.14.

Clifton Slusser, general superintendent, has returned from Akron where he spent several weeks introducing various new processes in tire making that had been originated at the Los Angeles plant. F. X. Kennelly, sales manager, and J. K. Haugh, manager of tire sales, spent the latter part of September in Akron.

The Los Angeles Rubber Club is the newest organization in its line. It is composed chiefly of executives of local rubber manufacturers and the larger rubber trading concerns and branch managers of the leading rubber companies of the country. J. B. Magee, branch manager of the United States Rubber Co., is president; Adolf Schleicher, president of the Samson Tire & Rubber Co., vice-president; and Frank Price, of Nelson & Price, tire dealers, is secretary and treasurer. The object of the club is to promote better feeling among those who largely influence the rubber trade in Los Angeles, to check unfair trade practices, to raise the business standards of willing small dealers, and gradually to educate the public to a better appreciation of rubber goods of all kinds. The club intends to hold luncheon meetings every Friday.

The United States Rubber Co. reports business excellent, tire sales alone being several times as much (in units) in some sections as recorded a year ago. The Los Angeles branch has thirty-seven salesmen and ten more will be added within a month. H. O. Bock, manager of tire sales, is now visiting the company's leading distributers in the entire southern California field.

The Eno Rubber Corporation, 1026 South Los Angeles street, Los Angeles, is one of the busy concerns in the Southwest. It is running strong especially on red and gray Eno tubes, Exso tires, numerous mechanicals, and also numerous patented specialties. The plan for financing the new concern which took over the old Eno business and whereby additional funds were sought for increasing production, is reported by R. R. Musser, president, as quite successful, and the company's position stronger than ever.

The use of inflated water wings, rubber inner tubes, and other air-containing articles by bathers has been forbidden by the authorities, Long Beach, California. Objection is not made to the new goods particularly but to their misuse and rough handling as well as the employment of nearly worn out tubes, which resulted in bursting and several narrow escapes from drowning.

The Los Angeles agency for one of the semisolid tire brands, Lambert "Trublpruf," made in Akron, Ohio, reports sales of over $60,000 during the past year. The Trublpruf Cord Tire Co., Figueroa and 31st street, controls the sales in the southwestern field.

San Francisco

George H. Mayo, of New York, vice-president of the United States Rubber Co., with Mrs. Mayo, son and daughter, have been visiting Pacific Coast points. Mr. Mayo has been the guest of J. P. Brady, general manager of the United States Rubber Co., west coast division at San Francisco, and of J. B. Magee, branch manager in Los Angeles.

H. A. Farr, manager of tire sales, and H. D. Chandlee, manager of mechanical sales of the west coast division of the United States Rubber Co., have been making a first-hand study of trade conditions in southern California and Arizona.

Thomas F. Kimball, director of Hood Rubber Products Co., Inc., Watertown, Massachusetts, and William McKinney, vice-president and director of Youngs Rubber Corporation, New York, N. Y., were recent visitors to the principal Pacific Coast cities.

The Coast Tire & Rubber Co. is running fifteen hours a day in two shifts, and is steadily breaking in new help. Its factory on 12th street between 48th and 50th avenues, Oakland, California, is one of the most up-to-date tire plants in the country. Asso-

ciated with the production company is the Coast Tire Sales Company, of which J. R. Freeman is president. This concern now operates seven stores and plans a number more.

Extensions are being made to the plant operated as The Pioneer Rubber Mills, at Pittsburg, California. The additions will include three one-story reinforced concrete buildings, which will cost approximately $150,000. The Pioneer organization manufactures rubber and cotton hose, rubber belting and all kinds of mechanical rubber goods. H. R. Mansfield is vice-president.

Southwestern Notes

Reports from Arizona state that the new crop of Pima long-staple cotton will be opening before the end of October. This cotton, to prevent it being contaminated, will be ginned at a special plant south of Phoenix and at a good distance from the main gins in the city. The Arizona Pima Cotton Growers' Association has arranged for $1,500,000 in loans for growers at 5½ per cent on a basis of 20 cents a pound for No. 1; 18 cents for No. 2; 16 cents for No. 3; and 14 cents for No. 4. This is in addition to the open credit which the War Finance Board will again extend to the growers. The association has also helped to reduce ginning, storage, and marketing costs, and thus enhance growers' profits.

Northwestern Notes

The Colby Compression Tube Co., East Burnside and Third streets, Portland, Oregon, is doubling the capacity of its plant. Plans are also being considered regarding the erection of other factories in various parts of the United States and Canada. Officials of the present corporation state that they are devoting their efforts to the production of compression inner tubes, for which they are finding a ready market. K. Young is secretary and treasurer of the organization.

Secretary of The B. F. Goodrich Co.

Men from many professions and other walks of life have been attracted to the rubber industry, and Frank Chapman Van Cleef, attorney-at-law, is a notable example.

Frank C. Van Cleef

Educated in the public schools of Wellington, Ohio, where he was born December 5, 1881, he was graduated from Oberlin College, Oberlin, Ohio, in 1904, and three years later received an LL. B. degree from the Columbia University Law School, New York, N. Y.

In 1907 he began the practice of law with the firm of Hoyt, Dustin, Kelley, McKeehan & Andrews, Cleveland, Ohio, counsel for The B. F. Goodrich Co., Akron, Ohio. There he came into prominence in connection with the suit brought in 1914 by the Automotive Cooperative Association of America against the Goodrich company and several other rubber companies, based on the claim that the association had suffered financial loss because these companies would not sell tires to it at wholesale prices. Mr. Van Cleef gathered the evidence, prepared the case for trial and won it. His appointment as resident counsel for the Goodrich company followed in November, 1916, a position which he held until his election as secretary and a director of the company on January 30, 1918.

Mr. Van Cleef is also a director of the National City Bank, Akron, Ohio; a member of the Legislative Committee, and chairman of the General Tax Committee of The Rubber Association of America. His clubs include Phi Beta Kappa; Phi Delta Phi; Akron City Club; Union Club, Cleveland, Ohio; and the Lawyers' Club, New York, N. Y.

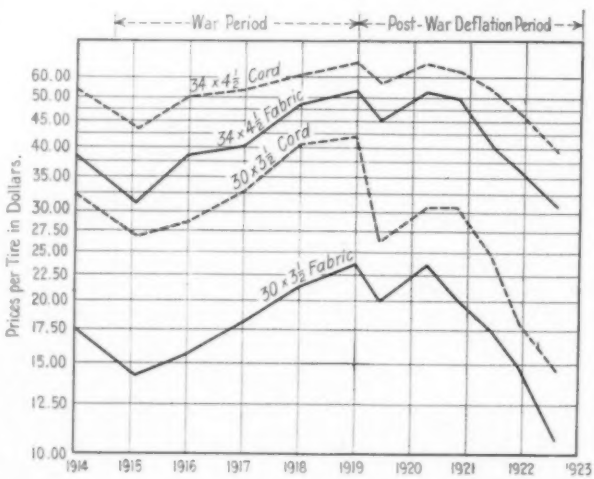
Tire Price Deflation

The rubber industry felt the effects of the present post-war depression more quickly and more severely than most other lines of business. It is of greater significance, therefore, that the manufacture of rubber products, and especially of tires, has been one of the first industries to recover its former activity. The tire demand of the present season compares favorably with that of the best months of 1920. The factory output of tires for September has approached or equaled that of August but present indications point the approach of the usual seasonal decline in demand. Scheduled tire production for the next three months will result ih curtailment of output by monthly ten per cent drops for October and November and 20 per cent for December from the figures for August and September.

INCREASE AND DECREASE OF TIRE PRICES

	Percentage Tire Price Increase Over Pre-War Level During War Sizes		Percentage Tire Price Decrease Below Pre-War Level During Deflation Sizes	
Kind of Tire	30 x 3½ Per Cent	34 x 4½ Per Cent	30 x 3½ Per Cent	34 x 4½ Per Cent
Fabric	27.75	29.00	42.00	20.25
Cord	38.00	26.75	54.50	25.50

The accompanying graphic chart embraces seven and one-half years, from six months previous to the outbreak of the World



Effect of War and Deflation on Standard Cord and Fabric Tire Prices

War to the present, and exhibits the fluctuations of consumers' prices on two sizes of standard cord and fabric tires. The graphs are strictly comparable because they are drawn on a ratio basis. They show that for tires, at least, deflation is practically completed and therefore it is futile to expect further decline in tire prices. This is because at present prices the consumer is receiving full advantage of the economies in manufacture resulting from the general adoption of accelerated vulcanization, and improved machinery and methods of construction.

Examination of the graphs shows that the rise in prices attributable to the war did not become effective until six months after its outbreak; that the rise due to this cause was not excessive. In connection with deflated tire prices the consumer is getting a marked advance in quality with consequent improvement of service expressed in mileage.

Activities of The Rubber Associations of America

Division and Committee Meetings

THE Specification Committee of the Mechanical Rubber Goods Manufacturers' Division held its first fall meeting in the association offices on September 14 and devoted the entire day to consideration of various questions involved in the detail of specifications for mechanical rubber goods. Substantial progress was made in reconciling differences of opinion between the users of specification goods and the manufacturers.

On September 26, the Executive Traffic Committee met at the Yale Club, and gave its attention in a preliminary way to a considerable number of traffic and transportation matters which were also discussed by the Traffic Committee as a whole on the following day at the same location. An unusually good attendance was secured and good progress was made on the subjects of certain rate and classification matters.

The Executive Committee of the Tire Manufacturers' Division held its regular monthly meeting at the Yale Club on September 27. The regular quarterly meeting of the Tire Division as a whole was held at the same place on the 28th. Both meetings were well attended and many subjects were discussed, prominent among which were the following: Relations with National Tire Dealers' Association, Marking of Tire Sizes, Disposition of Scrap Casings, Procedure in Tire and Rim Standards Work, and Spring Dating Terms.

A regular meeting of the Executive Committee of the Rubber Sundries Division was held at the Union League Club on the evening of September 12 and a very satisfactory session was had, many accumulated matters of a routine nature being disposed of.

1922 Questionnaire—First Half

Early in September the familiar six months' questionnaire compilation was distributed and proved to be of very general interest, particularly from the standpoint of the total crude rubber consumption and the total crude rubber inventory at the end of that period.

It is believed that the reported crude rubber consumption of 256,758,727 pounds (114,624 long tons) represents between 80 and 85 per cent of the total consumption in the United States during the first six months of 1922. This estimate, which is a conservative one, is based on comparison with government reports covering the year 1919, for which period the figures compiled by this office were exactly 84.9 per cent of the government figures covering the entire industry.

It is estimated also that the reported crude rubber inventory figure of 82,110 long tons as of June 30, 1922, is representative of 95 per cent of the total amount of rubber in the United States on that date. This is predicated on the fact that all of the rubber manufacturers who generally carry a good supply, and practically all of the crude rubber importers and dealers, have reported their figures. The 5 per cent balance is believed to be held by manufacturers or dealers who did not contribute to the report.

Educational Poster Concerning Tire Abuses

The Service Managers' Committee has completed its work of preparing the poster on common tire abuses which it is planned to distribute to tire dealers all over the United States and the poster is now in the hands of the printer who expects to begin deliveries within two weeks. It is expected that this poster, when displayed by the tire dealer will have a very beneficial effect in establishing permanently the Standard Tire Warranty and in having it understood and accepted by the tire consumer as fair to everyone concerned.

Foreign Language Editions of Straightside Tire Pamphlet

The distribution of the French, Danish and Dutch editions of the pamphlet presenting the advantages of the straightside type of tire equipment was effected in September and the remaining editions will follow early in October. The English issue was printed and distributed many weeks ago.

Board of Directors' Meeting Postponed

The September regular meeting of the Board of Directors was postponed until October 4, when the Board will meet at the Lotus Club, New York, N. Y., to dispose of matters which have accumulated during the summer.

Statistics Compiled from Questionnaire Covering the First Six Months of 1922[1]

Copyright, 1922, by The Rubber Association of America, Inc.

	Reported by Manufacturers Who Also Reclaim (24)	Reported by Reclaimers Solely (6)	Total
Reclaimed rubber produced from raw and cured scrap.....*pounds*	23,501,915	34,343,765	57,845,680
Scrap rubber (including raw and cured scrap) consumed in production of reclaimed rubber..*pounds*	30,768,329	47,125,625	77,893,954

NUMBER OF POUNDS OF CRUDE RUBBER CONSUMED IN THE MANUFACTURE OF RUBBER PRODUCTS AND TOTAL SALES VALUE OF SHIPMENTS OF MANUFACTURED RUBBER PRODUCTS

PRODUCT	Number of Pounds of Crude Rubber Used	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and tire sundries:		
Automobile and motor truck pneumatic casings	150,086,346	$192,890,053
Automobile and motor truck pneumatic tubes	37,630,043	25,660,091
Motorcycle tires (casings and tubes)	496,423	786,744
Bicycle tires (single tubes, casings and tubes)	984,876	1,769,331
All other pneumatic casings and tubes not elsewhere specified	1,163,048	1,773,147
Solid tires for motor vehicles	16,668,395	11,132,417
All other solid tires	487,334	572,814
Tire sundries and repair materials	2,501,992	4,874,061
Totals—Tires and tire sundries	210,018,457	$239,458,658
Other rubber products:		
Mechanical rubber goods	15,799,724	$32,361,089
Boots and shoes	12,457,112	39,392,773
Insulated wire and insulating compounds	2,144,790	7,305,200
Druggists' sundries, medical and surgical rubber goods	2,793,061	5,805,434
Waterproof cloth, clothing, and rubber sheeting	2,255,253	6,293,430
Hard rubber goods	2,122,174	3,155,510
Heels and soles	6,699,675	9,119,552
Miscellaneous, not included in any of above items	2,468,481	5,198,786
Totals—Other rubber products	46,740,270	$108,631,774
Grand totals—All products	256,758,727	$348,090,432

INVENTORY OF CRUDE RUBBER IN THE UNITED STATES AND AFLOAT FOR UNITED STATES PORTS, JUNE 30, 1922

ON HAND	Plantation	Pará	All Other
Manufacturers.....*long tons*	55,050	3,969	1,051
Importers and dealers	20,476	1,289	275
Totals.....*long tons*	75,526	5,258	1,326

Grand total—On hand, 82,110 long tons.

AFLOAT	Plantation	Pará	All Other
Manufacturers.....*long tons*	8,246	161	12
Importers and dealers	24,513	284	50
Totals	32,759	445	62

Grand total—Afloat, 33,266 long tons.

[1]The number of rubber manufacturers reporting data for the first half of 1922 was 219; the number of crude rubber importers and dealers reporting data was 53; and the number of reclaimers (solely) reporting data was 6. The total daily average number of employes, on basis of third week of January, 1922, was 133,281.

The Obituary Record

McGraw Branch Manager at Cleveland

LOUIS L. MCANANEY, branch manager of the McGraw Tire & Rubber Co., Cleveland, Ohio, died suddenly on September 2, of appendicitis, aged 48 years.

Louis L. McAnaney

Some twenty years ago Mr. McAnaney became identified with the rubber industry as a stenographer for The B. F. Goodrich Co., Akron, Ohio. Soon he was made a salesman for the company at Boston, Massachusetts, where his ability won promotion to management of the Cleveland, Ohio, branch. For over nine years he continued in this capacity, followed by four years as branch manager for the Republic Rubber Co., previous to his connection with the McGraw company. His pleasing personality, energy and ability made him one of the most popular tire men in Ohio, where his death is regarded as a great loss to the trade.

A thirty-second degree Mason, he was buried in Lakeview Cemetery with full Masonic honors. He is survived by his widow.

Pioneer Woman Rubber Clothing Manufacturer

Mrs. Emma V. Laughton, for many years general manager of the Chicago Rubber Co., Racine, Wisconsin, died in that city August 24, aged 74 years. A native of Platteville, Wisconsin, where she was born October 3, 1847, a daughter of N. H. Virgin, she became in 1867 the wife of George H. Laughton, founder in 1879 of Laughton & Co., the first rubber manufacturing concern in Chicago. Mrs. Laughton was the "company" and financial mainstay of the business.

Mrs. Emma V. Laughton

In 1882 the first factory in the West for the manufacture of the old sun-cured gossamer cloth was built at Grand Crossing, Illinois, and the business incorporated as the Chicago Rubber Clothing Co., Mrs. Laughton becoming secretary and treasurer. In 1887 the business was moved to Racine, Wisconsin, and on Mr. Laughton's death in 1893 Mrs. Laughton became general manager, a position which she ably filled until ill health obliged her resignation in 1916 and her retirement from business the following year.

Prominent in the social and religious as well as the business life of Racine, Mrs. Laughton was a trustee of the Universalist Church and a member of the Womens' Club, Daughters of the American Revolution and the Home Reading Circle. She was a woman of charming personality, great tact and administrative ability.

Well Known Crude Rubber Expert

Clement B. McKay, who for over five years looked after the crude rubber requirements of The Fisk Rubber Co., Chicopee Falls, Massachusetts, died recently of diabetes following a long illness since his return from Singapore in the autumn of 1920.

Clement B. McKay

Mr. McKay was born in Philadelphia, Pennsylvania, on June 9, 1878, and educated in the public schools of Dorchester, Massachusetts. He started in business with Charles A. Coe & Co., Boston, Massachusetts, which later became the New England Rubber Shoe Co., a branch of the United States Rubber Co. In 1903, in the employ of the New York Commercial Co., he went to the A. H. Alden Co. branch at Manáos, Brazil, where he familiarized himself with the wild rubber industry of the Amazon and became an expert in crude rubber.

In 1914 he returned to the United States and early in 1915 joined The Fisk Rubber Co. as New York representative and inspector of crude rubber. On taking charge of the firm's crude rubber supply, he went in June, 1918, to Singapore, where he remained until October, 1920, when he returned to America in impaired health.

Mr. McKay belonged to numerous Masonic bodies and was a member of The Rubber Association of America, and the Commonwealth Club, of Montclair, New Jersey. Many social and business friends join his widow, Mrs. Marion Flanders McKay, in mourning his untimely passing.

RUBBER BLANKETS FOR OFFSET PRINTING

Electricity generated in the pressroom during rapid changes of temperature sometimes makes necessary the use of special neutralizers. But electricity is not always the cause, as often supposed, for the clinging of sheets to the rubber blanket; often the blanket itself, injured by faulty or too frequent washings, is the real cause of the difficulty. The best remedy for these tacky blankets is to replace them with a reserve one, and treat them with the revulcanizing wash and powdered sulphur (flour of sulphur), leaving them to dry and mature for a few days.

Sometimes the trouble is removed by the substitution of a slightly thinner blanket with under packing smaller in size than the blanket itself, and only just large enough to cover the actual area the job or printing form will allow of. This takes the pressure from the edges of the paper where the bulk of the moisture is located. Care must be taken, however, in this device of underpacking if the sheet has become stretched.

It is absolutely imperative that only the best and most concentrated inks shall be used for the offset process in lithography. The continued accumulation of inks made from a sluggish and heavy base overloads the blanket, and destroys that sharp and clear effect which is the pride of offset printing.—*The National Lithographer.*

"CRUDE RUBBER AND COMPOUNDING INGREDIENTS" should be in the library of every progressive rubber man.

The Rubber Industry in Great Britain

By Our Regular Correspondent

COINCIDENT with the new low level of 7*d.* per pound for rubber quite a boom has arisen in the proofing trade, though it would not be correct to say that this is a case of cause and effect. Probably the persistently wet summer has as much to do with it as anything, but whatever the cause the boom is here and the expectation is that it will last some time. It is rather a new experience for salesmen to have to refuse orders for proofing, but this is what has occurred and there is the advance in the price of naphtha to support the statement.

It ought to be said that the boom is largely in connection with ladies' waterproofs and particularly with cheap single-texture cottons and paramattas, which are retailed at about 15*s.* in the shops. The low price catches the eye and people who are fond of something new and like frequent changes will buy something that will last three or four months. The main difference between the cheap and more expensive goods of this class is in the seams; in the cheap goods these are all done by machine, which merely presses the two edges of cloth together, while in the more expensive goods the seams are taped by hand, the difference soon becoming perceptible, in the case of heavy rain.

Unvulcanized Rubber Goods

It must be with mixed feelings that the dealer in sulphur and other rubber chemicals views the "Paremse" goods now being made by the licensed process of the Plantation Rubber Manufacturing Co., Limited, of 14 Mincing Lane, London, E. C. These goods are made on the rubber estate from crêpe and smoked sheet alone by means of certain necessary equipment. Crêpe rubber tennis soles are now being extensively used. With regard to protection or patents, no doubt crêpe rubber is a new thing, but in the early days of the industry blocks or sheets of natural rubber were used for making certain goods. It seems rather curious that a new importance now attaches to unvulcanized rubber, but probably all that has been claimed for vulcanization will not be found to have been due to faulty reasoning and the great bulk of goods will continue as before to undergo the process. Some goods, for instance air cushions and diving dresses, have always been unvulcanized and no doubt there are others which have undergone the process of vulcanization unnecessarily, but probably the ratio of unvulcanized to vulcanized goods will continue to be small.

Card Clothing and Card Grinding

This was the title of a paper read a few months ago before the Textile Society of the Manchester College of Technology by W. R. Hewson, a director of the old-established card clothing manufacturing firm of Horsfall & Bickham, Limited, Pendleton, Manchester. The subject is not one about which much appears in print, though of course the carding machine, perhaps the most important machine in cotton manufacturing, is well known wherever the industry flourishes. The original card clothing—which succeeded the teazel of hand carding—had a base of leather into which iron teeth were set at an angle by hand. As the carding engine developed so also came rapid improvements in the making of cards, an American named Amos Whittemore in 1797 taking out a patent for a machine to replace hand setting of the wire teeth. In 1830 another American named Dyer brought some card setting machines to Manchester, where he remained and took out a patent for them. His successors founded the old established Walton's works at Haughton Dale, Lancashire, dissolved only about fifteen years ago.

The firm of Horsfall & Bickham was founded in 1835 and patents taken out by the firm have led to the present-day machine, which has 26 motions and makes and sets about 400 teeth per minute. Soon after the firm's establishment a change was made from leather to various textile combinations of wool, cotton and linen, the facing with a sheet of natural rubber now so general being the invention of James Walton. In present practice not only is there a thin sheet of Pará rubber on the surface but also the various layers of textile are cemented by rubber solution. Today leather is used in cotton cards only for some takers-in and feed rollers, but it still has an important place in the making of woolen cards. Some woolen cards are faced with vulcanized rubber either red or gray, as being better fitted to stand oil or grease, while a good many have no rubber face but are composed of a woolen fabric with a strong linen warp cemented together with a special yellow cement and covered with calico. This is not affected by sunlight, heat, cold or oil, and is specially suitable for such countries as India, China and Brazil.

The manufacture of the cut sheet, rubber solution, etc., as carried out at the works, was briefly described, but this part of the paper was naturally of more novelty to a textile audience than it would be to the readers of these pages. A large part of the paper was concerned with technical details of interest to the cotton trade, such as methods of clipping on the tops, nailing on the fillets and grinding the cards. The author, with over fifty years' experience, dealt lucidly with his subject throughout and has given a valuable contribution to textile technical literature.

Determination of Sulphur in Rubber

Dyer and Watson, of the Royal Airship Works, Cardington, Bedford, describes an improvement in the process of estimating free and combined sulphur in rubber proofed balloon fabrics. The paper is to be found in the *Journal of the Society of Chemical Industry*, July 31, 1922. The main feature is the employment of potassium permanganate with and without nitric acid. The results given are practically the same as the troublesome Carius method, and the process appears to be rapid and easy of manipulation. The authors are careful to limit their claims for its utility to the particular material on which they have worked—that is, rubber and sulphur with only one or two per cent of mineral matter, but they have no reason to suppose that its utility is limited to such mixings. This modesty in their claims is commendable because there is no one method for the determination of sulphur which is applicable to everything which occurs in commerce under the name of rubber, some processes being much more affected by the nature and amount of added non-rubber materials than others.

Institution of Rubber Industry

The program for the winter season for 1922-23 is a decidedly attractive one and covers a rather long winter from September to May, inclusive. The opening papers are by F. Kaye on "Rubber Latex in Paper Making," at the London Section, and J. Torrey on "Reclaimed Rubber," at the Manchester Section. The same papers will not be read at London and Manchester, as was often the case last session, which is a wise move. Other papers to come are "Rubber Pigments," by D. F. Twiss, of the Dunlop company, and a "Review of All Solvent Recovery Processes," by J. H. Wild, of the Solvents Recovery Co., Limited. These promise to be of great technical interest. Nothing is said about other sections and it would seem that the Glasgow and Bristol ideas have not matured. Now that the North British and Dunlop companies have joined the Institution it remains to be seen whether other prominent members of the India Rubber Manufacturers' Association will continue to withhold their support.

The Rapson Tire

The Rapson Tyre & Jack Co., Limited, has moved into its new works at Burlington Road, New Malden, Surrey, and now has every facility for the output of its Super Cord pneumatic tires. Among those who have had their cars fitted with the tires are the Prince of Wales and the Prime Minister. It is hoped that before the end of the year the present output of 600 or 700 tires per week will have mounted to 2,000 per week. A feature of the tire is the inner tube, which acts as a deflector and air chamber, being molded in the form of a pear and being considerably thicker than is customary with inner tubes, there being an extra thickness on the tread and in the base of the wheel rim. In the construction of the cover the Super Cords are built up in double plies running one way, having ½-mm. of pure sheet rubber between the double plies and 1-mm. of pure sheet rubber insulator outside this.

The Bakelite Combine

Reference is made in THE INDIA RUBBER WORLD of August to the working arrangements made between the General Bakelite Co., the Condensite Co. of America and the Redmanol Chemical Products Co. It may be added that this combine includes all the producers of phenol condensation products, as the German interests are included as well as the British works which were founded under German auspices. One of the first acts of this combine was to institute a lawsuit against the holders of a British patent taken out a year or two ago and being largely used. The combine won the action and this patent is not now being used.

Spontaneous Combustion in Vegetable Black

The particular form of vegetable black which is made from charcoal has always been liable to spontaneous combustion, though this liability has depended a good deal on the precautions taken in its production and marketing. Wilson Bros. Bobbin Co., Limited, and S. C. Bone have recently patented the process of impregnating the black with an inert gas, preferably nitrogen, to prevent this liability to spontaneous combustion, and it ought to be successful. In the process the charcoal is taken direct from the wood-distilling retorts to a chamber containing the gas and is not exposed to the oxygen of the atmosphere. The company named above carries on a rather specialized industry, making bobbins for the textile trade from their own woodlands in the Lake District. Only certain parts of young trees are required and the large amount of waste wood is distilled for the production of charcoal and by-products.

Financial Notes

The Leyland & Birmingham Rubber Co., Limited, has declared a dividend of 5 per cent on the ordinary shares for the year ended last June. This is good as regards the trade because last year only the preference share interest was paid, the ordinary receiving nothing.

As most of the electric cable concerns have continued to do well during the slump it is somewhat surprising to find that Fullers United Electric Co., Limited, has sustained a loss of £129,408 in its last issued accounts. A scheme for reorganization of the capital is being considered and probably £150,000 in first mortgage debentures will be created and the capital reduced by writing off as lost 16s. per share in the issued ordinary shares.

RUBBER EXPORTS FROM INDO-CHINA

According to official statistics, Cochin China during 1921 exported to France and French colonies 2,656,434 kilos of rubber and 961,872 kilos to other countries, all together 3,618,306 kilos against 3,117,585 kilos in 1920. From Annam went 29,883 kilos in 1921, mostly to France, and 23,763 in 1920. Indo-China shipped 2,686,000 kilos to France and 962,209 kilos to other countries as compared with a total of 3,141,900 kilos in 1920.

In all, including 20 kilos from Tonkin, these French possessions during 1921 exported 7,296,418 kilos of rubber. In 1920 total shipments, including 510 kilos from Cambodge and 42 kilos from Tonkin, amounted to 6,283,000 kilos.

The Rubber Trade in Europe

By Our Regular Correspondent

Germany

Germany's rubber imports and exports during the first half of 1922 show an increase in imports of raw materials and also in the exports of manufactured goods. Thus 142,564 quintals of crude rubber, 3,640 quintals of gutta percha, 2,255 quintals of balata and 20,014 quintals of waste and old rubber, in all 168,473 quintals, were imported against a total of about 152,188 quintals during the last six months of 1921. As only 3,577 quintals were reexported, the net imports of raw material during the first half of 1922 amounted to 164,896.

During the same time only 2,854 quintals of manufactured goods were imported. Of this 2,780 quintals were of soft rubber and 74 quintals of hard rubber. The chief articles imported were: tires, 1,057 quintals; casings, 537 quintals; rubber combined with fabric, 172 quintals; press cloths and card clothing, 326 quintals; rubber thread, 121 quintals. The chief countries of origin were Belgium, Great Britain, France and Saar territory.

The exports of manufactured goods have steadily increased. In the year 1920 the figures for exports of rubber goods were 31,130 quintals; for the period May to December, 1921, 63,292 quintals; for January to June, 1922, 70,151 quintals. The increase as compared with 1921 is about 48 per cent, and as against 1920, 351 per cent. However, as the exports for 1913 were 197,000 quintals, averaging 16,418 quintals per month, the figures for 1922 are still about 29 per cent behind those for 1913.

The value of exports for the first half of 1922 is given as 1,315,000,000 marks. On the basis of the average value of a quintal of rubber goods exported in 1913, that is 651 gold marks per quintal, the value of the 1922 exports would be 45,670,000 marks. However, as the price of rubber has fallen considerably since 1913, this figure is probably too high.

Business Conditions

Apparently the rush of buyers to lay in stocks of goods owing to the panic created by the continued fall of the mark has come to a standstill. It is also rumored that some factories have had to shut down owing to inability to buy new stocks of raw material at the prevailing fantastic prices. Meanwhile, prices continue to move upward at an alarming rate.

The manufacturers of gutta percha goods announced an increase of 600 per cent on the basic price and an additional billing charge of 100 per cent. Later it was learned that prices would be altered as the mark fell. The asbestos manufacturers have raised prices to 1,200 and 1,000 per cent. Surgical goods producers announce increases to 1,000 per cent on mineralized rubber goods, hard rubber goods, catheters and sheet rubber goods; 1,700 on seamless goods; 1,500 per cent on pessaries; 700 per cent on tobacco pouches and bathing caps. Tires have been raised by 50 per cent. And so it continues through the list.

Prices of raw materials advance practically from hour to hour. The price of American fully middling cotton rose from 608.30 marks to 692.90 marks per kilo on August 18. Quotations for the best grades of plantation rubber were between 320 and 350 marks per kilo on August 19, when hard fine Pará brought 430 to 450 marks per kilo. The following week the prices in the Hamburg crude rubber market report were quoted in shillings and pence instead of marks.

There are those who, while realizing the advantages of a stable monetary value for Germany, consider that the low rate of exchange is not the worst thing for Germany as it enables Germans to do business.

However, judging from complaints of diminishing orders from foreign countries, the advantage gained by the difference in value of the mark abroad and at home is evidently being gradually wiped out by the greatly increased cost to Germans of the raw materials that they must import.

Ceka Rubberizing Solution

Soon after Dr. Ditmar pointed out the solubility of rubber and celluloid in the hydrated naphthalines, many attempts were made to make celluloid-rubber, but failed because, it is said, a perfect cellu-rubber for rubberizing cannot be made by following Ditmar's directions. However, Dr. Schmid & Co., Chemische Fabrik, Schorndorf, claims success in producing a rubber-celluloid solution that can be used on a spreading machine. Celluloid-rubber has this advantage over the usual rubber solutions in that vulcanizations become unnecessary.

Harmful Rubber Nipples

The *Gummi-Zeitung* of August 18, 1922, calls attention to an article by L. Lutz in the *Bulletin des Sciences Pharmacologiques* of March 23, 1922, in which it is claimed that rubber nipples colored by golden sulphuret of antimony are harmful. Lutz declares that when such nipples are boiled with diluted soda solution considerable quantities of sulphuret of antimony are given off.

The German writer states that red rubber nipples of German make are colored with cinnabar, which is harmless, while foreign goods contain golden sulphuret of antimony. These nipples are usually boiled in an alkaline solution at the factory to remove the sulphur bloom, and therefore the possibility of harm being caused by foreign nipples is out of the question.

Hungary

It is reported that the rubber industry is the only one in Hungary that up to the present has been able to progress undisturbed either by strikes for more wages or in other ways. It seems also that the Ungarische Gummiwarenfabrik A.-G. has plans for expansion as it has found a new market in England for its tires, heels, hose, surgical goods and toys. The factory is said to have exceeded its pre-war output.

Sweden

Shortly before the war the four Swedish rubber shoe factories, namely: Aktiebolaget Helsingborgs Gummifabrik in Helsingborg; Svenska Gummifabriksaktiebolaget in Gisläved, Ryska Gummifabrikaktiebolaget in Malmö, and the Skandinaviska Gummiaktiebolaget in Viskafors, formed a combine to control the rubber shoe industry in Sweden. After the outbreak of the war when Russian competition ceased, the position of the combine became still stronger. The factories have agreed not to undersell each other, to have similar discounts and conditions of payment and to divide the production among themselves in a certain ratio. Besides this, the combine fixes the retail prices.

In 1914 the capital of the four concerns was altogether 4 million kroner and by 1920 this had been increased to 14,230,000 kroner. However, of the increased capital only 390,000 kroner is represented by new subscriptions, the other 9,840,000 kroner consisting of gratis shares. The net profit of these firms during the ten-year period 1911 to 1920 totaled 35 million kroner. In 1915, 1916 and 1919 the profits were particularly high, being 62, 70 and 77 per cent, respectively. In 1920 shareholders received an average dividend of 26 per cent on the increased capital mentioned above. The retail price of rubber shoes in 1914 was 3 kroner per pair, and in 1921 8.50 kroner.

Official statistics show that the imports of rubber shoes in 1913 were 114,002 kilos; in 1914, 95,043 kilos; in 1919, 132,757 kilos; in 1920, 101,371 kilos; in 1921, 84,079 kilos. Exports amounted to 622,415 kilos in 1913; 602,931 kilos in 1914; 69,713 kilos in 1919; 99,131 kilos in 1920; and 286,387 kilos in 1921.

Russia

A Russian paper reports that the Russian State Rubber Trust has begun to export rubber goods. It seems that Poland has bought 4,000 pairs of rubber shoes and two carloads of other rubber goods. Latvia gave contracts for 30,000 pairs of rubber shoes and 5 carloads of other rubber articles. The Russians seem to be concentrating on the Baltic lands, where they expect to secure a contract for 300,000 more pairs of shoes. They are also paying attention to the Near East and are making special models of shoes to be sold in Turkey, Persia and Turkestan. The daily output of shoes by the rubber trust is reported to be 25,000 pairs.

Foreign Tariffs

Australia

Australia's customs duties levied on rubber goods are very high, and are designed to protect the local industry, which is one of importance. The first of the three rates of duty, as given below, applies to goods imported from the United Kingdom and its benefits may be extended wholly or in part to any British Dominion by negotiation, as may also be done in the case of the Intermediate Tariff. While no country receives this latter tariff at the present time, a special schedule has been arranged with the Union of South Africa, while negotiations are reported to be under way for extending a preferential treatment to Canada. Importations from the United States and the rest of the world not receiving the British Preferential Tariff are subject to the General Tariff stated in column 3.

Tariff No.	Articles	British preferential tariff	Intermediate tariff	General tariff
105	Piece Goods:			
	(H) Waterproofed cloth, prepared with rubber, oil, or celluloid—			
	(1) Woolen or containing wool *ad valorem*	30%	40%	45%
	(2) Silk or containing silk but not containing wool...*ad valorem*	20%	25%	30%
	(3) Leather Cloth.....*ad valorem*	5%	10%	15%
	(4) Not elsewhere included *ad valorem*	15%	20%	25%
130	(A) Canvas and duck, waterproofed by treatment with any substance *ad valorem*	15%	20%	25%
326	Leather, rubber, canvas, and composition belting, and green hide for belting and other purposes.....*ad valorem*	30%	35%	40%
328	Galoshes, rubber sand boots and shoes and plimsolls..... *per pair*	1s. 6d.	1s. 9d.	2s.
	or *ad valorem* whichever rate returns the higher duty.	25%	30%	35%
329	Boots, shoes, slippers, clogs, pattens, and other footwear (of any material), not elsewhere included; boots and shoe uppers and tops; cork, leather, or other socks or soles, not elsewhere included .....*ad valorem*	35%	40%	45%
330	Boots, rubber, viz.: Gum and wading boots...*ad valorem*	Free	5%	10%
331	Rubber and rubber manufactures, viz.: Rubber, crude; rubber, waste; hard rubber, in sheets; rubber thread; boot and apparel elastics; masticated rubber; rubber powdered or reclaimed	Free	Free	Free
332	(A) Rubber syringes, enemas, injection bottles, urinals, air and water beds, air cushions and pillows, and cut sheet surgical tubing....*ad valorem*	25%	30%	40%
	(B) Rubber and other hose; rubber manufactures, not elsewhere included, and articles not elsewhere included, in which rubber forms a part, including bandages, elastic stockings, leggings, knee caps, thigh-pieces and wristlets, rubber gloves, including surgeons', hatmaker's press bags and rings, gas bags, soles, pads, and heels, cash mats, rubbered tire fabric, tire rubber, photographic accessories of rubber not being integral parts of cameras; cycle and motor car repair outfits .....*ad valorem*	25%	30%	40%
	(C) Floor coverings and floor and carriage mats of rubber....*ad valorem*	25%	30%	40%
	(D) Any article composed wholly or in part of a rubber substitute shall be charged at the rate to which the article would be liable if it were composed wholly or in part of rubber.			

Tariff No.	Articles	British preferential tariff	Intermediate tariff	General tariff
333	(A) Pneumatic rubber tires, and tubes thereof, valved or unvalved—			
	(1) Covers weighing each 2½ lbs. or less; tubes weighing each 1 lb. or less .....*ad valorem*	25%	35%	40%
	(2.) Covers weighing each over 2½ lbs.; tubes weighing each over 1 lb. .....*per pound*	1*s.* 6*d.*	2*s.*	2*s.* 6*d.*
	or *ad valorem*	25%	35%	40%
	whichever rate returns the higher duty.			
	(B) Rubber tires other than pneumatic, including composition made up in form and size suitable for use with pneumatic tire covers as a substitute for the inner tube *ad valorem*	25%	35%	40%
375	(A) Atomizers for mining purposes *ad valorem*	Free	5%	10%
	(B) Atomizers, not elsewhere included, fumigators, odorizers, vaporizers, and the like.....*ad valorem*	15%	20%	25%
379	Blankets, rubber or wool for printing machines, top cloths for ruling machines, when imported with the machines of which they form a necessary working part, one or more required for working the machine..*ad valorem*	Free	Free	10%
419	Surgical and dental and veterinary instruments, appliances and materials (not being furniture), viz:			
	(A) Including bandages, n. e. i., dressing and instrument trays; accident and emergency cases; hot air apparatus for legs and arms, including X-ray apparatus; dental rubber; dental cements *ad valorem*	Free	10%	20%
420	Surgical appliances, not elsewhere included, including belts, trusses, pads, corsets, braces, breast supports, vaccination shields.....*ad valorem*	20%	25%	35%

Greece

A general revision of the import tariff of Greece, proposed June 24, is now being collected, with payment of duties on a gold basis. Rates are divided into two classes, general and conventional, and products of the United States are dutiable at the lower rates of the conventional schedule. It is noted that under Item 319C, "inner tubes and automobile accessories not specified" are listed as having a general rate of duty at 250 gold drachmas (1 drachma equals 9.6*d.* par value) per 100 okes (1 oke equals 2.8 pounds avoirdupois), while for a corresponding weight the conventional rate is estimated at 200 gold drachmas. Automobile tires are mentioned with the figure 5 as the "coefficient," indicating that the former customs tariff duty is to be multiplied by the coefficient, the resulting figures being the amount of the new duty, in gold.

Peru

Through a decree of the Peruvian Minister of Finance, exports of rubber, excepting balata, from the Departments of Madre de Dios and Loreto are exempted from the payment of export duties until December 31, 1922.

Portugal

A special surtax, which became operative July 22, has been levied on certain staple goods exported or reexported from Portugal, the Azores, or Madeira. Raw rubber appears among the commodities mentioned, with a rate of surtax at 100 escudos per metric ton. One escudo equals $0.50 normal United States currency.

Spain

A Royal Order, issued June 24, provides that solid and pneumatic tires, and inner tubes imported in quantity into Spain must be marked with a seal on entering the country, while such goods can be imported only through those custom houses which are authorized for the importation of textiles. All tires and covers manufactured in Spain must be marked with a factory mark duly registered with the Customs Administration. After December 24, or six months after the publication of the decree, all such goods which are not marked either with the registered factory mark or with the customs seal will be considered as illegally imported.

Rubber products, including tires and toys, made in the United States, are included in various goods which are given the benefit of reductions in Spanish tariff duties. These reductions are similar to the preferential rates recently granted to France, and include the following:

	Second tariff, pesetas per kilo	French rate pesetas per kilo
Rubber manufactures, including tires but not toys or waterproof fabrics.....	2.40 to 8	2 to 7
Toys, including those of rubber and celluloid	6 to 12	5 to 10

The rate listed as "second tariff," is that which previously applied to American products. The rate now will be similar to that of the French.

Sweden

A new Swedish law, becoming effective January 1, 1923, revises the present tax on rubber tires. Such tires imported into Sweden will, according to the new ruling, be subject to a tax of 1.50 crowns per kilo, to be paid with the duty (one crown equals $0.26.) Rubber tires on automobiles imported into the country are also subject to this tax, payable with the duty on the automobile. The tax, however, is not applicable in cases where exemption from customs duties has been granted.

It is further provided that manufacturers of rubber tires in Sweden must submit to the government, within a month after the close of every quarter, lists of tires sold to users or put into service for the manufacturer's own account.

The Rubber Trade in the Far East

By Our Regular Correspondent

Malaya

It is almost two years ago now that the slump first began and with rubber down to 25 cents a pound it seems that the condition is worse than ever. To be sure, the news that a majority of the Dutch have agreed to a scheme of control infused a feeling of confidence that has long been wanting. But the reply of the Dutch Minister of Colonies to the petition of the International Association of Rubber Growers, in which he declines to appoint a committee to report on governmental compulsory restriction, comes as a surprise and a disappointment to British growers.

A New Era Coming

Those who are facing the situation calmly can find many indications of a new era forthcoming in the rubber industry. Such persons take note of the successful experiments in bud-grafting in Java; of recently undertaken experiments in Malaya with the cultivation of various profitable crops so that Malaya may never again be caught with all her eggs in one basket; and they follow with interest the efforts at local rubber manufacture. In regard to the latter, it may be worth while to point out that one Chinese here is successfully selling in China his rubber manufactures produced locally and it is to be foreseen that others will shortly try to follow his example.

Labor

The recent laws drafted in India concerning assisted emigration give great powers of interference to the Emigration Council. All kanganies and recruiting agents shall be licensed, and before embarkation, the intending emigrant must appear before a magistrate, and the emigration agent is not to be present at the time. No contracts exceeding a month will be valid. Coolies will have to be imported free of expense to themselves and no advances made to them to facilitate their emigration can be recovered. Finally a recruiting country must accept an emigration agent of the In-

dian government and the local government must furnish such periodical reports regarding recruitment in India and the welfare of coolies in the colony as the Indian Government may require.

Ceylon

The *Ceylon Government Gazette* of March 23, 1922, publishes the following summary of a preliminary report on the production of rubber in Ceylon:

ACREAGE PLANTED, SEPTEMBER 30, 1921

A Estates	Acres
Seven years of age and over	250,776
Under seven years of age	50,652
Age not given	1,280
Total	302,708
Other estates, age not given	87,407
Total planted	390,115

Of the acreage in bearing September 30, 1921, 244,502 acres are from A Estates. The figures for other estates are not yet available.

PRODUCTION OF DRY RUBBER, YEAR ENDED SEPTEMBER 30, 1921

A Estates	Pounds
Sheet, all grades	27,426,067
Crêpe, all grades	37,830,566
Scrap, all grades	5,991,005
Grade not specified	188,800
Total	71,436,518
Other estates, grade not specified	11,433,417
Total production	82,869,935
	or 36,995 tons

The total amount of rubber manufactured, 82,900,000 pounds, in the year ended September 30, 1921, is about 6 per cent less than the exports in 1921.

Netherlands East Indies

According to official reports from the International Association at The Hague, 121 companies representing 204,000 bouws, have decided in favor of government intervention, while 39 companies representing 101,000 bouws planted with rubber, have declared themselves opposed to government aid. Some of the best known Dutch rubber concerns in Sumatra and Java are among the opposition.

It is quite evident, therefore, that the Dutch are not agreed upon a course of action. Indeed, one has only to take up the local papers to notice how opposed to each other are different members of the local rubber planting industry.

Meanwhile, in a single copy of the *Nederlandsch-Indisch Rubbertijdschrift*, that of August 1, the following company reports have been noted. The Nederlandsche Rubber Maatschappij reports a loss of 636,100 gilders for 1921. The Kali Telepak company had a loss of 57,791 gilders. The Padang Rubber Maatschappij reports a loss of 42,566 gilders against 47,677 gilders profit in 1920. The Preanger Rubber Maatschappij suffered a loss of 178,853 gilders in 1921.

Growth of the Dutch Rubber Industry

The rapid growth of the rubber industry in the Netherlands East Indies is illustrated by the following statistics of exports:

	Java and Madura Tons	Outer Possessions Tons	Totals Tons
1914	3,811	6,475	10,286
1915	7,509	12,380	19,889
1916	13,944	19,672	33,616
1917	18,843	26,775	45,618
1918	17,311	26,739	44,050
1919	35,263	54,460	89,723
1920	31,190	59,101	90,291
1921	29,400	.....	.....

The chief shipping ports in Java and Madura were:

	1914 Tons	1921 Tons
Tandjong Priok	1,988	12,942
Soerabaya	201	13,543
Tjilatjap	8,318	1,068
Samarang	87	556

The most important rubber district is the East Coast of Sumatra which in 1914 exported 5,148 tons and in 1920, 32,511 tons. The chief port is Belawan-Deli which shipped 3,516 tons in 1914 and 22,412 tons in 1920.

Tapanoeli, Sumatra, showed an increase of 364 tons in 1914 to 1,092 tons in 1920. All of this was shipped from the port Sibolga. The West Coast of Sumatra is practically new rubber territory. In 1914 the exports were so insignificant that no special mention of them was made. But in 1920 the shipments amounted to 300 tons.

Djambi, Sumatra, increased its exports from 123 tons in 1914 to 4,942 tons in 1920.

Atjeh advanced from 156 tons in 1914, to 1,236 tons in 1920.

Figures for Riouw are not very reliable but for the sake of completeness have been included. In 1914, 378 kilos were sent to Singapore, and in 1920 the exports had jumped to 8,187 tons.

The western division of Borneo (Dutch) shipped 140 tons in 1914 and 2,195 in 1920. The south and eastern sections of Borneo showed increases from 250 tons to 6,742 tons in 1920.

Yields from Budded Hevea

On Pasir Waringin, the estate that has become well-known owing to extensive bud-grafting carried out there by L. Tas, budded trees from 4½ to 5 years old are now being tapped.

The best results are shown by a group comprising 94 trees. The average over the fifteen days is 9.36 grams per day. On May 19 the highest average was secured, being 12.04 grams. The lowest was 8.28 on May 17. The list further shows that on 5 days the average was 8.28 and over, on 8 days 9.12 and over, and on one day 10.53 grams of dry rubber.

In 1916 seeds from known mother trees were planted and the young trees resulting were tapped in 1920, the same system being used as for the budded trees. The record shows that the average yields of dry rubber per tree and per day have been increasing fairly steadily, but the results do not compare favorably with those obtained from budded trees. Thus during April, 1920, the average was 1.89 grams; in November, 1920, this had increased to 3.55 grams and in August, 1921, had advanced to 5.44 grams.

From both sets of figures it is evident that the interest in budded trees will become greater.

Restriction Views

According to latest advices from Holland, there is a possibility that Dutch planters will cooperate with the British to bring about compulsory restriction. Although many more voices are heard in favor of such a measure here, still this is by no means the unanimous opinion on the subject. It is worthy of note that 16 Sumatra companies have asked the Dutch Minister for the Colonies not to support restriction.

C. M. Hamaker, president of the Rubber Planters' Association at Bandoeng, in an article to a local paper, declared against compulsory restriction. His standpoint is this. There is overproduction and consequently there has arisen a struggle for existence among producers. And now, except for a few convinced protectionists, only those who foresee that they will lose are asking for restriction. His advice to producers is to work hard, to rely only on their own powers and on the experiment stations.

An English producer in Malaya has made a report of an interview with a prominent Netherlands East Indies official, on the question of rubber restriction. The opinion of this official is considered to indicate the attitude of the local government on this subject. He is strongly opposed to compulsory restriction. His view of the future is dark and he fears that the whole industry will fall into the hands of the natives.

One plan for restrictions would forbid tapping altogether on certain days, thus avoiding the loss of labor. Another plan would provide three independent syndicates in Malaya, Ceylon and the Netherlands East Indies, each to cooperate when necessary. Estates having a high cost of production should stop tapping temporarily. Thus restriction would be effected and costs would be lowered. Of course the inoperative estates would share in the profits of the syndicate.

Recent Patents Relating to Rubber

The United States

Issued* August 1, 1922

NO. 1,424,162 Inner tube. B. G. Goble, Tulsa, Okla.
1,424,174 Life-saving suit. J. F. Mordica, Philadelphia, Pa.
1,424,187 Fluid container for injection. J. J. Seelman, Milwaukee, Wis.
1,424,301 Clasp for garters, etc. E. Helm, Tuxedo Park, N. Y.
1,424,329 Adjustable elastic shoulder underwear supporter, A. G. Walsh, Mobile, Ala.
1,424,360 Cushion tire. G. Jacobs, Detroit, Mich.
1,424,609 Elastic heel binder. E. W. Wood, Brooklyn, N. Y.
1,424,667 Elastic bottle protector. C. S. Murch, Highland Park, Mich.
1,424,730 Hydrometer. C. E. Linebarger, Chicago, Ill.
1,424,740 Attachment for water bottle stoppers or the like. M. C. Schweinert, West Hoboken, N. J.

Issued* August 8, 1922

1,424,787 Rubber tire. J. Todd, assignor to The Sterling Varnish Co.—both of Pittsburgh, Pa.
1,424,801 Garter. M. Byers, Brooklyn, N. Y.
1,424,802 Apparatus and manufacture of resilient tires. T. H. Channon, Fitzroy, Melbourne, Victoria, Australia.
1,424,824 Tire having casing with plurality of cells. O. Johnson and C. Neuman—both of Menasha, Wis.
1,424,893 Transmission lining. J. Galamb, assignor to Ford Motor Co.—both of Detroit, Mich.
1,425,021 V-type transmission belt. I. F. Kepler, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
1,425,148 Hose of predetermined action under pressure, L. A. Subers, Lakewood, O. (Renewed January 10, 1922.)
1,425,150 Stylographic fountain pen. R. Ullrich, Newark, N. J.
1,425,234 Blowout patch. J. Bordas, Miami, Fla.
1,425,356 Tread band for pneumatic tires. G. H. Allden, Folkestone, England.
1,425,475 Life belt. M. Heath, Yonkers, assignor to I. E. Letner, New York—both in N. Y.

Reissues

15,428 Locking device for tire valve to prevent inflation and displacement. A. M. Cummings, Aberdeen, Md. (Original No. 1,390,674, dated Sept. 13, 1921.)

Issued* August 15, 1922

1,425,509 Resilient heel. W. H. Clarke, Toronto, Ontario, Canada.
1,425,517 Rubber shoe sole with sewing rib. G. Ferguson, Wollaston, Mass., assignor to United Shoe Machinery Corporation, Paterson, N. J.
1,425,518 Rubber soled turn shoe and method of manufacture. G. Ferguson, Wollaston, Mass., assignor to United Shoe Machinery Corporation, Paterson, N. J. (Original application divided.)
1,425,532 Sanitary cap. G. M. Marr, Brooklyn, N. Y.
1,425,571 Two-band garter. J. Bear, Pittsburgh, Pa.
1,425,574 Battery jar and process of manufacture. E. S. Boyer, Plainfield, N. J., assignor to American Hard Rubber Co., New York, N. Y.
1,425,584 Teat cup for milking machines. F. A. Gessler, La Grange, assignor to Electric Milker Corporation, Chicago—both in Ill.
1,425,607 Fountain pen. J. C. Rorison, New York, N. Y.
1,425,668 Cushion tire. F. L. Marshall, Newton Center, Mass.
1,425,731 Heelless overshoe with ankle straps. M. V. Wilde, New York, N. Y.
1,425,788 Tire construction. F. D. Mayer, Chicago, Ill.
1,425,812 Pneumatic tire. E. J. Turek, St. Louis, Mo.
1,425,830 Ribbed circular mat. R. J. Bell, Richmond, Va.
1,426,005 Pneumatic tire. F. B. Pfeiffer, Akron, O.
1,426,057 Pneumatic cushion vehicle-body support and air control. W. G. Fritz, Clear Lake, Minn.
1,426,058 Pneumatic cushion shock absorber. W. G. Fritz, Clear Lake, Minn.
1,426,108 Resilient tire. D. M. Rothenberger, Leesport, assignor of 1/3 each to E. P. Wanner and W. M. Fryermugh, both of Reading both in Pa.
1,426,186 Wear plate for rubber heels. N. Harris, Indianapolis, Ind.
1,426,198 Rubber heel and method of manufacture. F. R. Keith, Randolph, Mass.
1,426,218 Sectional rubber heel. A. E. Rose, Brooklyn, N. Y.
1,426,296 Automobile pedal mat of two grades of rubber. J. H. S. Kerr, Toronto, Ontario, Canada.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

Issued* August 22, 1922

1,426,340 Cushion for telephone receivers. O. W. Aagaard, Chicago, Ill.
1,426,350 Tire valve. A. E. Bronson, Cleveland, O.
1,426,370 Gas control including gas bag, for flying machines. T. M. Finley, St. Louis, Mo.
1,426,402 Pneumatic cap. C. Moore, Cedar Rapids, assignor to F. L. Vernon, Newton—both in Ia.
1,426,635 Hose supporter. M. Hawie, Bridgeport, Conn.
1,426,636 Hose supporter. M. Hawie, Bridgeport, Conn.
1,426,672 Retread for tires and method of manufacture. D. R. Radford, Los Angeles, Calif.
1,426,692 Apparatus for holding and lifting glass by means of suckers. F. B. Waldron, Prescott, assignor to Pilkington Brothers Limited, St. Helens—both in England.
1,426,712 Golf ball. A. S. Chatfield, New York, N. Y.
1,426,721 Tire Valve. E. Erik, Ossining, assignor of ¼ each to B. Pindek and I. Pindek, Brooklyn—both in N. Y.
1,426,726 Dirigible balloon. J. W. Gilbert, Salina, Kans.
1,426,763 Cushion tire. M. O'Bannon, Daytona Beach, Fla.
1,426,800 Construction of rubber tire covers, stair treads, or the like. W. P. Whitehouse, Whitstable, England. (Granted under the provisions of the act of March 3, 1921, 41 Statute Law, 1313.)
1,426,886 Air-cushion wheel hub. B. V. Loutzkoy, Andreewka, Russia.
1,426,887 Pneumatic hub for vehicle wheels. B. V. Loutzkoy, Andreewka, Russia.
1,426,888 Pneumatic hub for vehicle wheels. B. V. Loutzkoy, Andreewka, Russia.
1,426,897 Tire repair. E. M. Moore and O. V. Peet, Indianapolis, Ind.
1,427,036 Cushion and spring inner tube. J. H. Taylor, assignor of 1/3 to M. G. Ross and M. E. Meredith—all of Mellen, Wis.

The Dominion of Canada

Granted August 1, 1922

221,569 Pneumatic tire. E. Hopkinson, New York, N. Y., U. S. A.
221,718 Pneumatic cushion tire. W. J. Hammond, Red Oak, Tex, U. S. A.
221,764 Waterproof clothing. The Tower Canadian, Limited, assignee of H. K. Hammond—both of Toronto, Ontario.
221,817 Tire gage. I. Pulverman, Warren, Pa., U. S. A.
221,818 Tire valve and gage. I. Pulverman, Warren, Pa., U. S. A.
221,819 Pressure gage for tires. I. Pulverman, Warren, Pa., U. S. A.

Granted August 8, 1922

221,860 Tire for vehicle wheels. J. Donkin, Kensington, London, W., England.
221,909 Transparent tire valve cap. I. Pulverman, Warren, Pa., U. S. A.
221,910 Transparent tire valve cap. I. Pulverman, Warren, Pa., U. S. A.
221,911 Transparent tire valve cap. I. Pulverman, Warren, Pa., U. S. A.
221,954 Double seal friction closure cap for jars. The Anchor Cap & Closure Corporation, Long Island City, assignee to E. Scofield, New York—both in New York, U. S. A.

Granted August 15, 1922

222,150 Cushion tire. W., R. H. and W. Reid, Jr., co-inventors—all of Hamilton, Lanark, Scotland.
222,205 Vulcanized wheel and tire of laminated canvas and rubber combined with metal disks. J. Flint, Darling Point, New South Wales, Australia.
222,217 Rubber stamp indicator. J. R. Hoffman, Philadelphia, Pa., U. S. A.
222,473 Tire valve. A. L. Cheek, Fort Worth, Tex., U. S. A.
222,540 Tire valve. T. H. C. Jones, Toronto, Ontario.
222,552 Pneumatic tire casing. W. Kline, Ellet, Ohio, U. S. A.
222,713 Garter. C. H. Cheater and E. F. Surcouf, assignee of ½ of the interest—both of Winnipeg, Manitoba.

Granted August 22, 1922

222,807 Protected bladder valve. C. J. Jensen, North Plainfield, New Jersey, U. S. A.
222,865 Windshield cleaner. A. W. Wessoleck, New Britain, Conn., U. S. A.
222,871 Non-puncturable pneumatic tire. O. Yates, Portland, Ore., U. S. A.
222,931 Detachable lining for brake bands. F. D. Deiffenbach, assignee of W. N. Mortimer—both of Cleveland, Ohio, U. S. A.
223,019 Tire valve. A. Schrader's Son, Inc., New York, N. Y., assignee of H. P. Kraft, Ridgewood, N. J.—both in the U. S. A.
223,032 Rubber heel tip for boots and shoes C. E. G. and A. V. Benbow, co-inventors—both of London, S. W. 17, England.

Granted August 29, 1922

223,080 Baseball mask with elastic straps. T. Goodman, Melrose Park, Ill., U. S. A.
223,107 Rubber repair part for heels. L. Rosenfeld, New York, N. Y., U. S. A.
223,133 Vulcanized fibrous material for tire fabric reinforcement. The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, assignee of A. E. Jury, Rutherford, New Jersey, U. S. A.
223,138 Cord tire. The Doughty Tire Co., Boston, Mass., assignee of H. J. Doughty, Providence, R. I.—both in the U. S. A.

Chemical Patents will be found on page 23; Machinery and Process Patents on pages 28-29

223,144 Corset with elastic portion. The Kops Bros., Limited, of Canada, Toronto, assignee of D. Kops, New York, N. Y., U. S. A.
223,182 Stippling brush of sponge rubber. C. G. Hampson, New York, N. Y., U. S. A.
223,253 Tire deflating device. W. E. Rowsome, Belleville, Ontario.

The United Kingdom

Published August 2, 1922

181,097 Insulated electric cables. L. N. Reddie, 1 Furnival street, Holborn, London.
181,104 Revoluble rubber heel pad. F. Rogers, 64A West Bar, Sheffield.
181,124 Pneumatic tire with metal ring between tread and casing. T. L. Harborne, 1 Shrubbery Terrace, Weston-super-Mare.
181,344 Ignition tester. Air Reduction Co., Inc., 342 Madison avenue, assignees of F. J. Metzger, 50 Morningside Drive—both of New York, N. Y., U. S. A. (Not yet accepted.)
181,351 Offset printing machine fitted with a rubber blanket. Leipziger Schnellpressenfabrik Akt.-Ges. formerly Schmiers, Werner, & Stein, 19 Dosener Wag, Leipzig, Germany. (Not yet accepted.)

Published August 10, 1922

181,412 Pneumatic tire pressure gage. A. Schrader's Son, Inc., Victoria Road, Willesden, London; J. A. Bowden, 741 South Catalina street, Los Angeles, Calif., U. S. A.
181,436 Metal foot treads or mats with flanged rubber studs. B. Firth, 216 Stockport Road, Levenshulme, and A. Firth, 21 Norman Grove, North Road, Longsight—both in Manchester.
181,531 Rubber covers for flexible joints. F. Reddaway, Cheltenham street, Pendleton, Manchester.
181,577 Partitioned inner tube. T. Griffiths, 7 Patteson street, Kensington, Liverpool.
181,588 Tire valves. R. Whiteside, 15 Molyneux Road, Kensington, Liverpool.
181,624 Reservoir pens. W. Shotton, 47 Stonehill street, Anfield, and J. A. Clough, 181 Lisburn Lane, Old Swan—both in Liverpool.
181,651 Surgical cupping appliances. P. Mahieu, 41 Rue d'Hautpoul, Paris, France.
181,707 Pneumatic tire with air spaces in tread portion. M. N. A. Develay, 24 Rue de Dunkerque, Paris, France. (Not yet accepted.)

Published August 16, 1922

181,797 Rubber sole pads. S. Percival, 40 Chancery Lane, London; N. E. J. Wells, 156 Queen street, Port Elizabeth, South Africa.
181,819 Catamenial appliance. W. A. Bowen, 22 Charles Road, Small Heath, Birmingham.
181,904 Rubber studs for boots, etc. W. F. Boichat, 16 Lower Kennington Lane, London.
181,937 Bladders for footballs, cushions, etc. W. M. Harrison, Pengelly House, Cheshunt, Hertfordshire.
181,942 Sponge rubber tire core, solid or wound over a helical spring, to replace an inner tube. R. B. C. Sheridan, 4 West Kensington Gardens, London.
182,021 Inner tube. W. L. Fairchild, Times Building, New York, N. Y. U. S. A.
182,025 Inner tube. F. B. Dehn, 53 Doughty street, London; Noceem Rubber Corporation, 705 Times Building, New York, N. Y., U. S. A.
182,032 Brassiere with elastic belt. Moore, Eady, & M. Goode, Limited, and N. R. Carryer, 89 Granby street, Leicester.
182,063 Detachable heel. A. Powell, 26 Rushton Road, Colbridge, Stoke-on-Trent.
182,073 Tire valve. Z. Littman, 633 West 171st street, New York, N. Y., U. S. A.

Published August 23, 1922

182,108 Cushion tire. C. E. Veil-Picard, 76 Avenue de Wagram, Paris, France. (Not yet accepted.)
182,189 Rubber mud-guards rotating with wheels. S. W. Dillon, 10 Hesper Mews, Earl's Court, G. G. Petherick, 2 Eaton Place, and S. F. Spinks, 18 Hesper Mews, Earl's Court—all in London.
182,265 Tire interliner of rubber enclosed metal. R. Blakoe, 46 Byranston street, Marble Arch, London.
182,292 Tire valve. W. E. Revill, The Gables, Sanderstead, Surrey.
182,297 Tire valve. H. P. Kraft, 219 Godwin avenue, Ridgewood, New Jersey, U. S. A.
182,327 Combined inflating and relief tire valve. J. Lumb, Conley Dene, Victoria Road, Elland, Yorkshire.
182,329 Rubber sole pads. M. Simpson, P. O. Box 6245 Johannesburg, South Africa.
182,344 Tire alarm device. F. E. Hafelfinger, 49 Third street, Weehawken, New Jersey, U. S. A.
182,380 Rubber stud for boots and shoes. R. L. Yeomans, 234 Harehills avenue, H. Stancliff, 2 St. Martin's Terrace, and J. A. Ibbetson, 22 Rossall Road—all in Leeds.

New Zealand

Published June 29, 1922

45,781 Swimming teaching device. G. Jordahn, Palm Beach, Fla., U. S. A.
47,427 Milking machine teat cup. J. E. Haywood, P. O. Box 1435, Auckland.
48,021 Accoustic instrument. A. Marr, 23 Reynell Road, Longsight, Manchester, England.

Published July 27, 1922

45,737 Milking machine teat cup. B. J. Pirrit, Morrinsville.
47,851 Tire valve. J. Lumb, Copley Dene, Victoria Road, Elland, Yorkshire, England.

Germany

Patents Issued, with Dates of Issue

360,111 (July 24, 1921) Woven inlay for treads of pneumatic tires. Ferdinand Rau, Werderstrasse 13, Konstanz.
360,163 (January 3, 1922) Pessary. Dr. Karl Lehmann, Roquetteweg 23, Darmstadt.
360,747 (April 26, 1921) Rubber sucker for sets of artificial teeth. Ernst Riese, Schildesche, near Bielefeld.

Design Patents Issued, with Dates of Issue

820,255 (May 26, 1922) Expansible life-belt with gas generator. Paul Herman, Tempelhofer Ufer 22, Berlin.
820,280 (June 8, 1922) Bust supporter. Rosenberg & Herz, Kölnam-Rhein.
820,299 (June 13, 1922) Pneumatic tire casing with metal protector. W. Herbert Aldridge, Portland, United States; represented by M. and A. Spreer, Leipzig.
820,301 (June 13, 1922) Pair of rubber soles. Gummiwerke Paffrath A.-G., Paffrath, near Bergisch-Gladbach.
820,304 (June 13, 1922) Solid rubber tire with concave sides and non-skid tread. Aaron Edwin Jennings, Owensboro, Ky., U. S. A.; represented by M. and A. Spreer, Leipzig.
820,320 (June 16, 1922) Rubber fastening for bottles and vessels. Emil Meine, Halkettstrasse 48, Hannover.
820,471 (June 14, 1922) Swimming belt. Domenico Agus, Cagliari, Italy; represented by M. Gugel, Munich.
820,508 (February 1, 1922) Rubber sole. Schmidt's Gummiwarenfabrik Arthur Schmidt, Stade.

Trade Marks

The United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted August 1, 1922, Act of February 20, 1905

157,361 SONCO—rubber or rubber composition erasers. J. Meyers Stationery & Printing Co., Inc., New York, N. Y.
157,382 NUBBER—rubber preservative. Rubber Process Corporation, Detroit, Mich.
157,394 Heavy outlined rectangle with vertical line bisecting it—brake linings. Thermoid Rubber Co., Hamilton Township, Mercer County, N. J.

Granted August 8, 1922, Act of February 20, 1905

157,450 TEDDY BEAR and representation of a bear superimposed above a circle—children's and misses' garters. American Wholesale Corporation (Baltimore Bargain House), Baltimore and Cumberland, Md.
157,467 B. B. Co. arranged as a monogram on a shield—baseballs, footballs, etc. Buettell Brothers Co., Dubuque, Ia.
157,477 THE SNUG ARCH SHOE within double-outlined oblong with rounded corners—shoes and boots of leather, canvas, rubber, etc., for men, women and children. Churchill & Allen Co., Brockton, Mass.
157,494 EAGLE WYDEWEB GARTER within an oval—hose supporters and garters. Eagle Suspender & Belt Co., Inc., Philadelphia, Pa.
157,496 SHUR-VISION—windshield cleaners. C. A. Edwardsen, doing business as D. L. Witmer & Bro., Philadelphia, Pa.
157,587 Small child in underclothes, one garter in place, tugging at the other with a small dog—baby pants. A. Stein & Co., Chicago, Ill.

Granted August 15, 1922, Act of February 20, 1905

157,737 TIGER—elastic. William T. Palmer & Co., Inc., New York, N. Y.
157,779 PARATRIX—elastic corsets. Treo Co., Inc., New York, N. Y.
157,780 PARAREX—elastic corsets. Treo Co., Inc., New York, N. Y.
157,781 PARATEX—elastic corsets. Treo Co., Inc., New York, N. Y.
157,782 ANCHORBAND—elastic corsets. Treo Co., Inc., New York, N. Y.

Granted August 22, 1922, Act of February 20, 1905

157,856 PEGGY PRUE in fancy letters within a diamond—raincoats. Artistic Designers, Inc., Louisville, Ky.
157,922 INVINCIBLE—acid-resisting garments of rubberized cloth, namely, aprons, sleeves, and leggings. The Defiance Welding Co., Defiance, O.
157,977 TEE GREEN—golf balls. J. V. Hogue, New York, N. Y.
158,008 GABERETTE—raincoats. W. MacPherson, doing business as Cambridge Rubber Co., Cambridge, Mass.
158,038 NATIONAL BROAD WEAVE GARTER—garters. The National Garter Co., Cincinnati, O.
158,070 OAK-IDE—rubber or composition rubber soles and heels. The Republic Rubber Corporation, Youngstown, O.
158,138 RED FLASH—golf balls. John Wanamaker, New York, N. Y.

Act of March 19, 1920, Section 1 (b)

158,155 COMER—raincoats, etc. The Comer Manufacturing Co., Dayton, O.

Granted August 29, 1922, Act of March 19, 1920, Section 1 (b)*

158,327 ALLIS-CHALMERS—machinery of various kinds, including that for rubber mills. Allis-Chalmers Manufacturing Co., Milwaukee and West Allis, Wis.

158,347 BEST IN THE LONG RUN—rubber cement of various kinds, and tire repair outfits. The B. F. Goodrich Co., New York, N. Y.

The Dominion of Canada

Registered

31,499 "SPARK-C" enclosed within an ellipse—ignition tester with hard rubber tube. Canadian Westinghouse Co., Ltd., Hamilton, Ont.

31,502 PREST-AIR stamped over a faucet—tire inflator and fire extinguisher. H. H. Moore, Timmins, Ont.

31,505 VOLTITE—hard rubber sheets, molded goods, tubing and rods, and electric tape and compound. Gutta Percha and Rubber, Ltd., Toronto, Ont.

35,511 OH BOY associated with the representation of a girl carrying a pair of skates—overshoes, overgaiters, rubbers and footwear. W. G. Lewis, Auburndale, Mass.

31,536 LEADER—tires, tubes, casings, reliners, water bottles, syringes, invalid rings, ice bags, tobacco pouches, and football bladders. The F. E. Partridge Rubber Co., Ltd., Guelph, Ont.

31,537 STAR within a star design—electrical appliances having hard and soft rubber parts, including radio equipment. The Fitzgerald Mfg. Co.

31,541 DURO-CORD—tires and tubes. C. Kenyon Co., Inc., New York, N. Y.

31,543 PARIS in large type above the words ARM BANDS in similar smaller type, both in white with black outlines, on an oval field above the words, NO METAL CAN TOUCH YOU, in black type—arm bands. A. Stein & Co., Ltd., Toronto, Ont.

31,570 Representation of female classical warrior, with the word INCA on her casque—rubber pads for boot and shoe soles and heels. Blakey's Boot Protectors, Ltd., Armley Malleable Ironworks, Modder Place, Armley, Leeds, Yorkshire, England.

31,571 Representation of male classical warrior, with the word INCA on his casque—rubber pads for boot and shoe heels and soles. Blakey's Boot Protectors, Ltd., Armley Malleable Ironworks, Modder Place, Armley, Leeds, Yorkshire, England.

31,659 P. C. M. and representation of a star—inner tubes. Pirelli & Co., Milan, Italy.

31,745 ADAMS SWEET SCENT; a panel bearing the words, STANDARD FLAVOUR; a circular figure bearing the words, ONE CENT; and words, ELEGANT CONFECTION; and the representation of a ribbon having a bow at its lower end, partly around the foregoing features—chewing gum. Canadian Chewing Gum Co., Ltd., Toronto, Ont.

The United Kingdom

Published August 2, 1922

413,828 CHEKKO—brake linings of material covered by Class No. 50. Cresswells' Ltd., Wellington Mills, Wellington street, Laisterdyke, Bradford, Yorkshire.

426,505 AUTOGRAF—rubber tobacco pouches. W. Chittenden, 285 Old Kent Road, London, S. E. 1.

Published August 9, 1922

420,036 MILMAC—macintoshes and rainproof garments. S. Miller, 6 King street, Salford.

423,567 Representation of a seal bearing the representation of a cock crowing, standing on top of the globe, beneath a scroll bearing the words, WHILE I LIVE I'LL CROW, all within an ornamental circular frame surrounded by the words, BAKELAQUE INSULATION, Best British Manufacture—clerical insulating materials included in Class No. 50. Attwater & Sons, Hopwood Street Mills, Hopwood street, Preston, Lancashire.

426,144 ETHOPHONE—receiving and transmitting apparatus included in Class No. 8, for wireless telegraphy or telephony. Burndept, Ltd., Aerial Works, Blackheath, London, S. E. 16.

426,192 Representation of a band on the leg of a fowl or bird, the bird standing on a person's hand and the band being pointed to by the forefinger of another hand—celluloid composition rings for poultry, pigeons and cage birds, included in Class No. 50. H. J. Bunyard, trading as The E. D. G. Appliance Co., 27 Alderman's Hill, London, N. 13.

426,441 CANDUCK—packings and jointings included in Class No. 50. James Walker & Co., Ltd., Lion Works, Garford street, Poplar, London, E. 14.

Published August 16, 1922

417,841 Representation of a label bearing the words, PARAFLOR RUBBER CARPETING, the name of the manufacturer, and the representation of a pair of balances—rubber floor coverings. The North British Rubber Co., Ltd., Castle Mills, Fountainbridge, Edinburgh, Scotland.

420,667 MICRONEX—gas and carbon black used as rubber compounding ingredients. Binney & Smith Co., 81 Fulton street, New York City, U. S. A.; for service in United Kingdom, address care of Marks & Clerk, 57-58 Lincoln's Inn Fields, London, W. C. 2.

422,825 RODCOL—goods included in Class No. 40, composed of rubber and vegetable fibrous material, waste leather, etc., the rubber predominating. C. R. Collyer, 423 Fulham Road, Chelsea, London, S. W. 6.

425,952 FIZYTUP—preservative composition for coating inner covers of tires. P. Horton, Gilgal, Stourport, Worcestershire.

B425,987 Representation of a label bearing the words: THE "PARAMAC" FEATHERWEIGHT WATERPROOF, beneath the trade mark of a tree above a scroll bearing the words, *Industria nil Impossibile*, the whole being surrounded with a conventional border and the bottom part being provided with space for description of the goods labeled—waterproof garments. Z. Birnbaum & Son, Limited, 3B, Cannon street, St. Paul's Churchyard, London, E. C. 4.

426,704 APOLLO—radio and similar electrical apparatus. Craies & Stavridi, Apollo House 4, Bunhill Row, London, E. C. 1.

Published August 23, 1922

425,573 VULSOL—rubber solution. H. E. G. Bateman, 18 Western Broadway, Hammersmith, London, W. 6.

426,014 BRALEX—goods manufactured from rubber and gutta percha not included in classes other than Class No. 40. The British Xylonite Co., Ltd., Hale End, London, E. 4.

427,170 BERAPLAST—rubber medicated plasters for human use. Hausmann (Societe Anonyme), 11 Marktgasse, St. Gall, Switzerland.

Published August 30, 1922

423,095 VANITY—fountain and stylographic pens. The Lang Pen Co., Ltd., 13 Hope street, Liverpool, Lancashire.

426,675 "CASALOY"—steam and hydraulic packing for high pressures. The Castleton Steam Packing Co., Ltd., Atlantic street, Broadheath, Altrincham, Cheshire.

425,840 Silhouette representation of a cat with exaggerated tail extended to form a background for the words, THE TYRE WITH NINE LIVES—tires. Etablissements Hutchinson, 124 avenue des Champs Elysées (2 rue Balzac), Paris, and 70 Basinghall street, London, E. C. 2.

426,699 CLINCHER CORD—tires and parts. The North British Rubber Co., Ltd., Castle Mills, Fountainbridge, Edinburgh, Scotland.

427,611 SEMANCO—games of all kinds and sporting goods, not included in classes other than Class No. 49. Chas. Macintosh & Co., Ltd., 2 Cambridge street, Manchester.

Designs

The United States

Issued* July 4, 1922†

61,155† Tire. Term 14 years. A. I. Frank, Milwaukee, Wis., assignor by mesne assignments to The Fisk Rubber Co., Chicopee Falls, Mass.

Issued* August 1, 1922

61,287 Rubber typewriter mat. Term 14 years. T. W. Arter, Bellaire, O.
61,290 Tire tread. Term 14 years. F. A. Bollinger, assignor to The Firestone Tire & Rubber Co.—both of Akron, O.
61,295 Garment protector. Term 14 years. M. S. George, St. Louis, Mo.
61,333 Tire. Term 14 years. I. P. Smith, Chicago, Ill.

Issued* August 8, 1922

61,335 Tire tread. Term 3½ years. E. O. Blekre, Sioux City, Ia.
61,336 Tire. Term 7 years. W. G. Current, assignor to The Buckeye Rubber Products Co.—both of Willoughby, O.
61,351 Tire tread. Term 3½ years. P. D. Saylor, Buffalo, N. Y.
61,382 Footwear. Term 3½ years. H. Schwerin, Brooklyn, N. Y.

61,290 61,335 61,336 61,333 61,396 61,351

Issued* August 22, 1922

61,387 Inflatable doll. Term 14 years. F. W. Dodge, assignor to The Seamless Rubber Co., Inc.—both of New Haven, Conn.
61,388 Inflatable doll. Term 14 years. F. W. Dodge, assignor to The Seamless Rubber Co., Inc.—both of New Haven, Conn.
61,396 Tire tread. Term 14 years. H. D. Mitchell, assignor to C. Kenyon Co.—both of Brooklyn, N. Y.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

†For illustration of this and other designs issued as of this date, see THE INDIA RUBBER WORLD, September 1, 1922, page 845.

The Dominion of Canada

Registered

5,515 Ignition tester with hard rubber tube. Canadian Westinghouse Co., Ltd., Hamilton, Ont.
5,527 Tire tread. J. G. Hayward, Hamilton, Ont.
5,535 Inflatable rubber clown doll. J. W. Bicknell, Toronto, Ont.

Review of the Crude Rubber Market

New York

THERE was little trading during the first week of the past month, due to high and firm prices in the far eastern markets. The following week opened quiet with strong London cables. Dealers did most of the trading and factories were not interested, making spot purchases only. By the middle of the month the market advanced ¼-cent in all positions, following the trend of events in London, but within a few days reacted to the preceding levels.

The course of the market during the last week was somewhat erratic because of the uncertainty of the outcome of the negotiations in London on the Stevenson plan for restricting output. Trading was limited owing to the high cost of rubber at primary points, dealers showing no willingness to pay the high prices paid by American factories in their purchases in the Far East. The latest influence affecting the plantation rubber market is stiffening of price attributed to the purchases of English manufacturers.

Parás have been steady and neglected the whole month. There has been nothing doing in other grades as well.

Importations of all grades during August were 21,764 tons compared with 13,974 tons one year ago. Plantation arrivals for August were 20,462 tons compared with 13,031 tons for August one year ago. Total importations of all grades for eight months ended August 31 were 177,367 tons as compared with 104,378 tons for the corresponding period last year.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATIONS. SEPTEMBER 1. Spot first latex crêpe, 13¾-13⅞ cents; September-October, 13¾ cents; October-December, 14 cents; January-March, 14½ cents. SEPTEMBER 25. Spot first latex crêpe, 14¾ cents; September-October, 14⅞ cents; October-December, 15 cents; January-March, 15¼ cents.

SEPTEMBER 1. Spot ribbed smoked sheets, 13¾-13⅞ cents; September-October, 13⅞-14 cents; October-December, 14¼ cents; January-March, 14½ cents. SEPTEMBER 25. Spot ribbed smoked sheets, 14⅝ cents; September-October, 14¾ cents; October-December, 14⅞ cents; January-March, 15⅛ cents.

SEPTEMBER 1. Spot, No. 1 amber crêpe, 13½-13⅝ cents; September-October, 13¾ cents; October-December, 14 cents. SEPTEMBER 25. Spot, No. 1 amber crêpe, 14⅛ cents; September-October, 14½ cents; October-December, 14¾ cents.

SEPTEMBER 1. Spot, No. 1 rolled brown crêpe, 11⅛-11¼ cents; September-October, 11⅜ cents; October-December, 11⅝ cents. SEPTEMBER 25. Spot, No. 1 rolled brown crêpe, 11¾ cents; September-October, 12 cents; October-December, 12¼ cents.

SOUTH AMERICAN PÁRAS AND CAUCHO. SEPTEMBER 1. Spot, upriver fine, 18½ cents; islands fine, 17 cents; upriver coarse, 13 cents; islands coarse, 9 cents; Cametá, 8¾ cents; caucho ball, 12¾-13½ cents. SEPTEMBER 25. Spot, upriver fine, 19 cents; islands fine, 16¾ cents; upriver coarse, 13¾-14 cents; islands coarse, 10 cents; Cametá, 9½ cents; caucho ball, 13 cents.

London

The market a month ago began with continued dullness, later becoming stronger and more active as stocks declined and American interests began buying in London at 7¼*d*. Announcement

New York Quotations

Following are the New York spot quotations per pound, for one year, one month ago, and September 25, the current date:

	October 1, 1921		September 1, 1922		September 25, 1922	
Plantation Hevea						
CREPE						
First latex	$0.16	@	$0.13¾	@.13⅞	$0.14¾	@
Off latex	.15	@	.13⅝	@	.14¼	@
Amber No. 1	.13½	@.14	.13½	@.13⅝	.14⅜	@
Amber No. 2	.12½	@.13	.13⅜	@	.14¼	@
Amber No. 3	.11½	@.12	.13⅛	@	.14	@
Brown, thick, thin, clean	.13	@.13½	.13	@	.13¼	@
Brown, specky	.12	@	.12½	@	.12¾	@
Brown, rolled		@	.11⅛	@	.11¾	@
SHEET						
Smoked, ribbed	.15¼	@	.13¾	@.13⅞	.14⅝	@
Smoked, plain	.13½	@		@		@
Unsmoked		@		@		@
SCRAP						
Colombo scrap No. 1		@	.10½	@	.11¼	@
Colombo scrap No. 2		@	.09	@	.10	@
East Indian						
PONTIANAK						
Banjermassin	.06	@.06½	.07¾	@	.07½	@
Palembang		@	.08¼	@		@
Pressed block	.11	@	.12	@	.11½	@
Sarawak	.05½	@	.06½	@	.06¾	@
South American						
PARAS						
Upriver fine	.21	@	.18½	@	.18⅞	@.19
Upriver fine*		@	*.29	@	*.26	@
Upriver medium	.17	@	.16	@.17	.17	@.17½
Upriver coarse	.11	@	.13	@	.13¾	@
Upriver weak, fine	.18	@	.15	@	.15	@
Islands fine	.19	@.20	.17	@	.16¾	@.17
Islands fine*		@	*.28	@	*.25	@
Islands medium	.14½	@	.15¼	@	.15	@.15½
Islands coarse	.08	@	.09	@	.09	@.09½
Cametá	.09	@.10	.08¾	@	.09	@.09½
Cametá*		@	*.19	@	*.18½	@
Acre Bolivian fine	.21	@.22	.18⅝	@	.19	@
Acre Bolivian fine*		@	*.29	@	*.26	@
Beni Bolivian	.21	@.22	.18⅝	@	.19¼	@.19½
Madeira fine	.24	@	.19½	@.21	.19½	@.20
Peruvian fine	.18¾	@	.17½	@	.17¾	@
Tapajos fine	.19	@	.17¼	@.17½	.18	@
CAUCHO						
Upper caucho ball	.11	@	.13¾	@	.13½	@.13¾
Upper caucho ball*		@	*.19	@	*.18½	@
Lower caucho ball	.10½	@	.12¾	@	.11½	@.12
Maniçobas						
Ceará negro heads	†.10	@	†.09	@	.08	@
Ceará scrap	†.08	@	†.05	@	.05	@
Maniçoba 30%, guaranty	†.10	@	.07	@	.07	@
Mangabeira, thin sheet	†.12	@	†.11	@	.12	@
Centrals						
Central scrap	.08	@.10	.10	@.11	.10	@.12
Central scrap and strip	.07	@.09	.07	@.08	.08	@.09
Central wet sheet		@	.05	@.07	.06	@.08
Corinto scrap	.08	@.10	.10	@.11	.10	@.12
Esmeralda sausage	.08	@.10	.10	@.11	.10	@.12
Guayule washed and dried	.26	@	.26	@	.26	@
Africans						
Benguela, No. 1, 28½%	.04	@.04½		@	.07	@
Benguela, No. 2, 32½%		@	.06	@	.05½	@
Congo prime, black upper		@	.09	@.10	.08	@
Congo prime, red upper		@	.11	@	.11	@
Kassai, black		@	.10	@	.08	@
red		@	.09½	@	.11	@
Gutta Percha						
Gutta Siak	.15	@	.14½	@.15	.15	@
Red Macassar	2.50	@2.70	2.75	@3.90	2.80	@
Balata						
Block, Ciudad Bolivar	.53	@.54	.53	@	54½	@.55
Colombia	.41	@.42	.45	@	.45	@
Panama	.41	@.42		@	.45	@
Surinam sheet	.63	@.64	.68	@	.67	@.68
amber	.70	@.71	.72	@	.72	@.73
Chicle						
Colombia		@	.50	@	.19	@.25
Honduras		@	.70	@.72	.63	@.64
Venezuela		@	.70	@.72	.65	@
Yucatan fine		@	.75	@	.68	@

*Washed and dried crêpe. Shipment from Brazil.
†Nominal.

was made just after the middle of the month that the Dutch Government has decided not to restrict plantation output by legislative means. The Stevenson plan for restriction is being actively considered but no decision has been reached as yet.

On September 26 prices were firmer and demand good. Stocks are declining, the figures for September 23, being 71,167 tons compared with 72,224 tons the previous week, 72,639 tons the corresponding date one year ago, and 34,834 tons two years ago.

Reclaimed Rubber

The conditions of reclaimed rubber demand remain virtually unchanged. Growing activity in mechanical goods lines, insulation, weatherproof clothing, heels and other rubber goods utilizing reclaimed rubber is expected to be reflected in greater reclaiming activity. Rubber reclaiming continues to be conducted on a basis of fractional capacity.

The following prices are nominal and unchanged since July 1, 1922.

New York Quotations

September 25, 1922

Prices subject to change without notice

STANDARD RECLAIMS	
Floating	$0.12 @ $0.13
Friction	.12 @ .13
Mechanical	.08 @ .10
Shoe	.10¼ @ .10¾
Tires, auto	.09 @ .10
truck	.09 @ .10
White	.13 @ .14

Comparative Low and High New York Spot Rubber Prices

	September 1922*	September 1921	September 1920
PLANTATIONS			
First latex crêpe	$0.13¼ @ $0.15	$0.14 @ $0.16	$0.24½ @ $0.29
Smoked sheet, ribbed	.13⅜ @ .14⅜	.13¾ @ .15¾	.23½ @ .28¼
PARAS			
Upriver, fine	.18¼ @ .19	.17½ @ .21½	.26 @ .30
Upriver, coarse	.13½ @ .14	.09½ @ .11½	.16½ @ .21
Islands, fine	.17 @ .17½	.16½ @ .19	.24 @ .28
Islands, coarse	.08½ @ .09½	.07 @ .09½	.15 @ .19
Cametá	.08¾ @ .09½	.07½ @ .09¼	.15 @ .17

*Figured to September 25, 1922.

Amsterdam Rubber Market

JOOSTEN & JANSSEN, Amsterdam, report, under date of September 5, 1922:

Prices gradually advanced this week with a firm tone and increasing turnover. It is hardly possible to name a special reason but locally some covering in for near deliveries has supported the movement. The close is at best, namely:

Hevea crêpe and sheets, Fl. 39 spot.
Hevea crêpe and sheets, Fl. 40½ October to December.
Hevea crêpe and sheets, Fl. 41½ January to March.

Singapore Rubber Market

GUTHRIE & CO., Limited, Singapore, reports, under date of August 11, 1922:

The rubber market has continued weak, and prices are again a shade easier. For the weekly auctions, held yesterday, the heavy total of 925 tons was cataloged. Demand was only fair and a considerable quantity had to be withdrawn.

A few lots of standard quality sheet and unawarded sheet in cases sold for 23¾ cents, but this price was not general. There was a fair inquiry for good F. A. Q. at 24¼ to 24½ cents. Off sheet was one cent down. Pale crêpes found ready buyers and continue to command a premium over sheet. Lower grade crêpes were steadier and 475 tons were sold.

The following is the course of values:

	In Singapore per Pound	Sterling Equivalent per Pound in London
Sheet, fine ribbed smoked	24¼	—/ 7⅞
Sheet, good F. A. Q.	24¼ @ 24½	—/ 7⅞ @ —/ 7⅞
Sheet, off quality	21 @ 24	—/ 6⅞ @ —/ 7¾
Crêpe, fine pale	24¾ @ 25	—/ 8⅜ @ —/ 8½
Crêpe, good pale	24 @ 24½	—/ 8¼ @ —/ 8⅜
Crêpe, off quality	22¼ @ 23¾	—/ 7⅜ @ —/ 8⅛
Crêpe, fine brown	22½ @ 23	—/ 7¾ @ —/ 8
Crêpe, good brown	21 @ 22¼	—/ 7⅛ @ —/ 7¾
Crêpe, dark	17½ @ 21¼	—/ 6¼ @ —/ 7⅛
Crêpe, bark	16¼ @ 19¾	—/ 6 @ —/ 7

Plantation Rubber Exports from Malaya

	January 1 to July 31, 1922			January 1 to August 11, 1922	
	Singapore Pounds	Malacca Pounds	Penang Pounds	Port Swettenham Pounds	Totals Pounds
To United Kingdom	2,954,700	7,198,300	2,629,100	10,185,641	22,967,741
The Continent	14,832,800	1,344,200	2,637,200	565,913	19,380,113
Japan	17,266,400	.....	56,000	.....	17,322,400
United States	174,271,500	20,825,800	18,397,500	2,847,239	216,342,039
British Possessions	3,677,700	.....	52,400	577,950	4,308,050
Other countries	295,700	.....	3,200	.....	298,900
Totals	213,298,800	29,368,300	23,775,400	14,176,743	280,619,243

British Malaya Rubber Exports

It is reported officially by cablegram from Singapore that 47,747,600 pounds (21,316 tons) were exported from British Malayan ports in the month of August, compared with 21,964 tons in July and 19,167 tons in June. August transhipments amounted to 3,366,000 pounds (1,503 tons).

New York Average Spot Rubber Prices

PRICES IN CENTS PER POUND

	August, 1922																				September, 1922			
PLANTATIONS	7	8	9	10	11	12	14	15	16	17	18	19	21	22	23	24	25	26	28	29	30	31	1	2
Sheet																								
Ribbed smoked	14½	14½	14⅛	14⅛	14⅛	14⅛	14⅛	13⅞	13¾	13⅝	13⅝	13⅝	13⅞	13⅝	13¾	13¾	13¾	13¾	13¾	13¾	13⅝	13¾	13¾	13¾
Crêpe																								
First latex	14½	14½	14⅛	14⅛	14⅛	14⅛	14	13⅞	13¾	13⅝	13⅝	13⅝	13⅞	13⅝	13⅝	13⅝	13¾	13¾	13¾	13¾	13¾	13⅝	13¾	13¾
Off latex	13⅞	13½	13¾	13¾	13¾	13⅜	13¾	13⅜	13⅜	13½	13½	13½	13½	13½	13¼	13⅜	13½	13½	13⅜	13⅝	13½	13⅜	13⅜	13⅜
No. 1 blanket	14½	14½	14	14	14	13⅞	14	13¾	13¾	13⅝	13¾	13½	13¾	13¼	13⅜	13½	13⅝	13¾	13¾	13¾	13⅝	13⅝	13¾	13⅝
No. 2 blanket	13⅝	13⅝	13⅝	13⅝	13⅝	13⅝	13⅝	13½	13½	13⅜	13⅜	13¼	13⅜	13⅜	13⅜	13¼	13⅜	13⅜	13½	13⅜	13⅜	13⅜	13⅜	13⅜
No. 3 blanket	13½	13½	13½	13½	13¾	13½	13½	13¼	13⅛	13	13⅛	13	13⅛	13	12⅝	13	13⅛	13¼	13¼	13¼	13¼	13¼	13	13
Thin, clean, brown	13½	13½	13½	13½	13½	13½	13⅝	13¼	13⅛	12⅞	13⅛	13⅜	13⅛	13	12⅞	13	13	13	13⅛	13⅛	13⅛	13	13¼	13¼
Specky brown	12½	12½	12⅞	12½	12½	12½	12⅝	12¾	12½	12½	12⅝	12½	12⅝	12⅝	12½	12¾	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝	12⅝
Rolled brown	11⅛	11⅛	11¼	11⅜	11⅛	11¼	11¼	11⅛	11⅛	11	10⅞	10⅞	10⅞	10¾	10⅞	11	11	11⅛	11⅛	11	11¼	11⅛	11⅛	11⅛

United States Crude and Waste Rubber Imports for 1922 (By Months)

	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1922	Totals 1921	Balata	Miscellaneous	Waste
January ..... tons	20,774	916	161	16	....	....	21,867	14,177	42	126	85
February	27,270	1,347	301	14	....	41	28,973	8,641	28	448	6
March	27,711	451	326	3	154	57	28,702	14,416	17	479	61
April	13,910	462	5	2	65	....	14,444	17,269	8	122	....
May	19,485	1,072	3	....	62	....	20,622	10,733	15	855	117
June	14,851	861	14	3	....	21	15,750	13,477	12	526	23
July	24,563	575	102	2	....	3	25,245	11,692	50	541	45
August	20,462	1,175	119	8	....	....	21,764	13,974	33	640	77
Totals, 8 months, 1922. tons	169,026	6,859	1,031	48	281	122	177,367	.....	205	3,737	414
Totals, 8 months, 1921	95,493	7,996	757	71	58	3	.....	104,378	294	1,302	1,629

Compiled by the Rubber Association of America, Inc.

Crude Rubber Arrivals at New York as Stated by Ships' Manifests

Parás and Caucho

	Fine	Medium	Coarse	Caucho	Totals Pounds
AUGUST 19. By "Polycarp," from Pará, Manáos, and Brazil.					
H. A. Astlett & Co.	22,400	.....	.....	22,400	44,800
General Rubber Co.	.....	.....	.....	.....	†11,200
L. Littlejohn & Co., Inc.	33,164	.....	.....	.....	33,164
SEPTEMBER 1. By "Michael," from Manáos, Iquitos, and Pará.					
L. Littlejohn & Co., Inc.	290,856	.....	.....	.....	290,856
Poel & Kelly, Inc.	66,609	15,612	10.480	9,055	101,756
Ultramares Corporation	2,462	.....	394	39,874	42,730
H. A. Astlett & Co.	22,400	.....	11,200	.....	33,600
Paul Bertuch	15,873	.....	14,814	.....	30,687
SEPTEMBER 2. By "Cuyaba," Pará and Brazil.					
Paul Betuch	.....	.....	11,956	.....	11,956
General Rubber Co.	.....	.....	.....	.....	†22,400
Meyer & Brown, Inc.	56,000	.....	.....	.....	56,000
SEPTEMBER 9. By "Bronte," Pará.					
General Rubber Co.	56,000	.....	2,240	6,720	64,960
Poel & Kelly, Inc.	44,988	1,865	7,264	11,696	65,813

Plantations

(Figured at 180 lbs. net to the bale or case.)

	Pounds	Totals
AUGUST 19. By "Rotterdam," Rotterdam.		
L. Littlejohn & Co., Inc.	112,000	
H. Muehlstein & Co., Inc.	22,400	134,400
AUGUST 21. By "Verbania," London.		
Various	89,280	89,280
AUGUST 22. By "West Faralon," Singapore.		
Charles T. Wilson Co., Inc.	‡44,800	44,800
AUGUST 22. By "Hansa," Amsterdam.		
L. Littlejohn & Co., Inc.	224,000	224,000
AUGUST 23. By "Feliciana," London.		
L. Littlejohn & Co., Inc.	168,186	
Various	115,134	283,320
AUGUST 24. By "Wray Castle," Far East.		
H. A. Astlett & Co.	246,400	
Baird Rubber & Trading Co., Inc.	56,000	
Continental Rubber Co. of New York	78,400	
General Rubber Co.	26,880	
F. R. Henderson & Co., Inc.	677,000	
Hood Rubber Co.	*231,300	
Hood Rubber Co.	11,190	
L. Littlejohn & Co., Inc.	2,849,040	
Meyer & Brown, Inc.	112,000	
H. Muehlstein & Co., Inc.	366,000	
Poel & Kelly, Inc.	884,498	
Fred Stern & Co., Inc.	100,807	
Charles T. Wilson Co., Inc.	160,160	
Jaeger & Co.	53,640	
William H. Stiles & Co.	141,120	
Baring Bros.	430,920	
Edward Maurer Co., Inc.	57,240	
E. G. Curry & Co., Inc.	19,440	
Thos. A. Desmond & Co.	243,900	
American Trading Co.	79,920	
The Firestone Tire & Rubber Co.	2,288	
Huth & Co.	67,320	
Pacific Trading Corporation of America	9,000	
Paterson, Simmons & Co.	74,520	
Thornett & Fehr, Inc.	50,400	6,999,383
AUGUST 26. By "Ryndam," Holland.		
Adolph Hirsch Co., Inc.	43,600	43,600
AUGUST 27. By "Nagato Maru," Soerabaya.		
Various	104,580	104,580
AUGUST 27. By "Jadden," Far East.		
H. A. Astlett & Co.	145,600	
L. Littlejohn & Co., Inc.	1,202,880	
H. Muehlstein & Co., Inc.	112,000	
Poel & Kelly, Inc.	134,800	
Fred Stern & Co., Inc.	27,936	
General Rubber Co.	596,670	
Various	180,770	2,400,656
AUGUST 28. By "Veendyk," Far East.		
H. A. Astlett & Co.	56,000	
Baird Rubber & Trading Co., Inc.	100,800	
Continental Rubber Co. of New York	56,000	
General Rubber Co.	280,779	
F. R. Henderson & Co., Inc.	44,800	
J. T. Johnstone & Co., Inc.	49,272	
L. Littlejohn & Co., Inc.	1,568,000	
Meyer & Brown, Inc.	235,200	
H. Muehlstein & Co., Inc.	280,000	
Poel & Kelly, Inc.	490,408	
Fred Stern & Co., Inc.	100,495	
Charles T. Wilson Co., Inc.	142,240	
Various	*121,860	
Various	687,946	4,213,800
AUGUST 29. By "Shunko Maru."		
Continental Rubber Co. of New York	112,000	
L. Littlejohn & Co., Inc.	168,000	
Meyer & Brown, Inc.	22,400	
H. Muehlstein & Co., Inc.	33,600	
Poel & Kelly, Inc.	877,500	
Various	63,600	1,277,100
AUGUST 30. By "Independence," Kobe.		
Various	18,000	18,000
SEPTEMBER 1. By "Kazembe," Far East.		
William H. Stiles & Co.	571,200	
H. A. Astlett & Co.	448,000	
Baird Rubber & Trading Co., Inc.	112,000	
Continental Rubber Co. of New York	134,400	
General Rubber Co.	191,440	
F. R. Henderson & Co., Inc.	22,400	
Adolph Hirsch & Co., Inc.	33,600	
Hood Rubber Co.	*337,200	
J. T. Johnstone & Co., Inc.	9,570	
L. Littlejohn & Co., Inc.	1,892,800	
Meyer & Brown, Inc.	268,800	
H. Muehlstein & Co., Inc.	560,000	
Poel & Kelly, Inc.	534,587	
Fred Stern & Co., Inc.	*56,000	
Fred Stern & Co., Inc.	89,600	
Charles T. Wilson Co., Inc.	483,840	
Various	*320,500	
Various	3,349,533	9,415,470
SEPTEMBER 1. By "Dakarian," London.		
Fred Stern & Co., Inc.	11,953	
Various	38,967	106,920
William H. Stiles & Co.	56,000	
SEPTEMBER 2. By "Phemius," Far East.		
William H. Stiles & Co.	392,000	
H. A. Astlett & Co.	324,800	
Continental Rubber Co. of New York	11,200	
General Rubber Co.	382,000	
F. R. Henderson & Co., Inc	98,800	
Hood Rubber Co.	*127,974	
J. T. Johnstone & Co., Inc.	13,552	
L. Littlejohn & Co., Inc.	2,845,800	
Meyer & Brown, Inc.	571,200	
Poel & Kelly, Inc.	430,540	
Fred Stern & Co., Inc.	157,067	
Charles T. Wilson Co., Inc.	338,240	
Various	*201,606	
Various	3,006,219	8,900,998
SEPTEMBER 1. By "City of Lahore," Far East.		
F. R. Henderson & Co., Inc.	92,800	
L. Littlejohn & Co., Inc.	338,240	
Poel & Kelly, Inc.	44,800	
Fred Stern & Co., Inc.	8,960	484,800
SEPTEMBER 2. By "Verentia," London.		
Various	430,740	430,740
SEPTEMBER 3. By "Saconia," Liverpool.		
Various	1,800	1,800
SEPTEMBER 4. By "Muroran Maru," Far East.		
Poel & Kelly, Inc.	11,200	
Various	125,140	136,340
SEPTEMBER 4. By "Westerdyk," Rotterdam.		
Various	46,080	46,080
SEPTEMBER 6. By "Margaret Dollar," Far East.		
William H. Stiles & Co.	280,000	
H. A. Astlett & Co.	280,000	
Baird Rubber & Trading Co., Inc.	78,400	
Continental Rubber Co. of New York	67,200	
F. R. Henderson & Co., Inc.	560,000	
Hood Rubber Co.	56,000	
J. T. Johnstone & Co., Inc.	44,352	
Poel & Kelly, Inc.	750,400	
L. Littlejohn & Co., Inc.	1,077,440	
Meyer & Brown, Inc.	44,800	
H. Muehlstein & Co., Inc.	56,000	
Hood Rubber Co.	*100,950	
Fred Stern & Co., Inc.	188,989	
Charles T. Wilson Co., Inc.	152,520	
Various	*18,930	
Various	2,151,259	5,907,240
SEPTEMBER 6. By "Madioen," Far East.		
F. R. Henderson & Co., Inc.	33,600	
L. Littlejohn & Co., Inc.	795,200	
Meyer & Brown, Inc.	89,600	
H. Muehlstein & Co., Inc.	89,600	
Poel & Kelly, Inc.	40,672	
Fred Stern & Co., Inc.	45,193	
Various	71,815	1,165,680
SEPTEMBER 7. By "Menominee," London.		
L. Littlejohn & Co., Inc.	8,878	
Fred Stern & Co., Inc.	22,393	
Various	1,309	32,580
SEPTEMBER 7. By "The Lambs," Far East.		
H. A. Astlett & Co.	67,200	
Continental Rubber Co. of New York	134,400	
General Rubber Co.	550,480	
F. R. Henderson & Co., Inc.	78,400	
J. T. Johnstone & Co., Inc.	12,320	
L. Littlejohn & Co., Inc.	903,920	
Meyer & Brown, Inc.	112,000	
H. Muehlstein & Co., Inc.	122,600	
Poel & Kelly, Inc.	343,161	
Fred Stern & Co., Inc.	209,288	
Various	*21,600	
Various	345,871	2,901,240
SEPTEMBER 10. By "Clan MacBrayne," Far East.		
Paul Bertuch	22,400	
L. Littlejohn & Co., Inc.	246,400	
H. Muehlstein & Co., Inc.	22,400	
Poel & Kelly, Inc.	33,600	
Fred Stern & Co., Inc.	4,500	
Various	18,100	347,400
SEPTEMBER 13. By "Vasconia," Far East.		
J. T. Johnstone & Co., Inc.	72,723	
L. Littlejohn & Co., Inc.	112,000	
Charles T. Wilson Co., Inc.	224,000	
Various	90,957	499,680
SEPTEMBER 13. By "Egremont," Far East.		
L. Littlejohn & Co., Inc.	56,000	56,000
SEPTEMBER 15. By "Bowes Castle," Far East.		
William H. Stiles & Co.	291,200	
H. A. Astlett & Co.	123,200	
Baird Rubber & Trading Co., Inc.	56,000	
Continental Rubber Co. of New York	11,200	
General Rubber Co.	745,920	
Adolph Hirsch Co., Inc.	33,600	
Hood Rubber Co.	*134,650	
F. R. Henderson & Co., Inc.	306,000	
J. T. Johnstone & Co., Inc.	24,640	
L. Littlejohn & Co., Inc.	2,699,200	
Meyer & Brown, Inc.	268,800	
Poel & Kelly, Inc.	241,920	
Fred Stern & Co., Inc.	69,440	
Charles T. Wilson Co., Inc.	515,200	5,520,970
SEPTEMBER 15. By "Mesaba," London.		
Fred Stern & Co., Inc.	10,864	10,864
SEPTEMBER 17. By "Biyo Maru," Far East.		
Poel & Kelly, Inc.	313,500	313,500

Rubber Latex

SEPTEMBER 7. By "The Lambs," Soerabaya.		
Various	16,000 gal.	16,000 gal.

Pontianak

AUGUST 12. By "Diana Dollar," Singapore.		
Various	140,000	140,000
AUGUST 14. By "Alcinous," Singapore.		
Various	58,600	58,600
AUGUST 18. By "Eastern Light," Singapore.		
Various	93,600	93,600
AUGUST 18. By "Bolton Castle," Singapore.		
L. Littlejohn & Co., Inc.	201,600	201,600
AUGUST 24. By "Wray Castle," Singapore.		
Various	109,000	109,000

Gutta Siak

AUGUST 18. By "Bolton Castle," Singapore.		
L. Littlejohn & Co., Inc.	112,000	112,000
AUGUST 28. By "Veendyk," Far East.		
Various	24,000	24,000
SEPTEMBER 1. By "Kazembe," Singapore.		
L. Littlejohn & Co., Inc.	56,000	
Various	4,000	60,000
SEPTEMBER 7. By "The Lambs," Singapore.		
Fred Stern & Co., Inc.	11,200	11,200

Gutta Percha

AUGUST 23. By "Wray Castle," Singapore.		
L. Littlejohn & Co., Inc.	13,440	13,440
SEPTEMBER 6. By "Madioen," Sourabaya.		
Various	27,000	27,000

Balata

AUGUST 17. By "Sixaola," Cartagena.		
G. Amsinck & Co., Inc.	900	
Various	1,350	2,250
AUGUST 19. By "Polycarp," Manoás.		
Various	4,800	4,800
AUGUST 19. By "Surinam," Paramaribo.		
Middleton & Co., Ltd.	29,500	
William Schall & Co.	8,550	38,000
AUGUST 26. By "Colon," Cristobal.		
Various	1,650	1,650
AUGUST 31. By "Michael," Iquitos.		
Ultramares Corporation	23,881	23,881
SEPTEMBER 3. By "Alamagra," Buenaventura.		
Ultramares Corporation	4,000	4,000
SEPTEMBER 5. By "Prins der Nederlandin," Paramaribo.		
Middleton & Co., Ltd.	8,500	8,500
SEPTEMBER 7. By "Metapan," Colombia.		
Various	1,200	1,200

*Arrived at Boston. †Camtá. ‡Arrived at San Francisco.

Exports of India Rubber Manufactures from the

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Leather Cloth or Artificial Leather Value	Waterproofed and Auto Cloth and Auto Topping Value
EUROPE													
Azores and Madeira Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belgium	$5,280	$3,106	$144	$2,936	.....	.....	.....	.....	.....	.....	.....	.....	$1,168
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	43
Denmark	300	.....	442	.....	.....	.....	1,276	$900	.....	.....	.....	$1,289	479
Finland	1,981	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
France	6,341	.....	249	27,251	.....	.....	.....	.....	1,224	$902	.....	25,838	.....
Germany	.....	16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gibraltar	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Greece	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	320	.....
Iceland and Faroe Islands	.....	.....	.....	.....	768	$3,090	543	639	.....	.....	.....	.....	.....
Italy	.....	.....	300	9,116	282	942	2	2	.....	.....	$575	7,378	69
Malta, Gozo, and Cyprus Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	905
Netherlands	199	2,104	.....	.....	.....	.....	.....	.....	1,032	478	.....	121	.....
Norway	412	902	.....	.....	.....	.....	120	95	2,952	2,000	34	1,235	2,085
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portugal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	755	705
Rumania	.....	.....	80	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Russia in Europe	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spain	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12,916	237
Sweden	2,048	45	152	.....	.....	.....	.....	.....	.....	.....	8	5,122	.....
Switzerland	.....	.....	.....	2,859	.....	.....	5,680	3,721	.....	.....	.....	1,209	176
Turkey in Europe	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ukraine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	250
England	661	8,923	4,519	26,825	928	1,672	8,438	3,863	4,411	4,403	1,040	9,876	3,400
Scotland	288	125	680	.....	100	420	.....	.....	.....	.....	.....	1,640	.....
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yugoslavia, Albania, etc	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, EUROPE	$17,560	$15,221	$6,566	$68,987	2,078	$6,124	16,059	$9,220	9,619	$7,783	$1,657	$67,699	$9,517
NORTH AMERICA													
Canada—Maritime Provinces	$173	$302	$4	.....	482	$1,326	.....	.....	422	$491	$20	$108	.....
Quebec and Ontario	2,590	9,307	3,984	$4,053	157	513	24	$32	381	644	184	17,802	$21,508
Prairie Provinces	55	637	192	.....	1	8	.....	.....	448	499	18	563	477
Brit. Columbia and Yukon	2,133	2,374	787	.....	883	4,054	241	469	.....	.....	.....	384	676
British Honduras	.....	82	31	.....	4	18	359	281	1,487	1,395	.....	12	7
Costa Rica	170	28	.....	.....	.....	.....	.....	.....	.....	.....	197	247	.....
Guatemala	.....	70	.....	.....	.....	.....	.....	.....	1,677	1,600	1,371	736	.....
Honduras	93	1,235	95	.....	.....	.....	48	24	1,001	1,020	10	130	.....
Nicaragua	.....	68	311	.....	.....	.....	.....	.....	240	310	1,100	.....	.....
Panama	32	1,781	21	.....	.....	.....	2,181	2,454	4,790	4,111	555	110	.....
Salvador	.....	.....	40	.....	.....	.....	.....	.....	324	293	1,109	132	.....
Mexico	19,586	16,351	3,193	108	23	128	11	10	17,896	14,319	14,745	2,445	2,691
Miquelon and St. Pierre Islands	.....	.....	.....	.....	1,404	4,788	.....	.....	.....	.....	.....	.....	.....
Newfoundland and Labrador	232	83	.....	.....	7,530	18,742	8	7	858	595	1,073	173	554
Bermuda	.....	104	.....	.....	.....	.....	.....	.....	230	249	13	31	98
Barbadoes	.....	.....	.....	.....	.....	.....	.....	.....	288	236	.....	50	112
Jamaica	.....	234	.....	.....	.....	.....	.....	.....	5,451	5,857	89	155	937
Trinidad and Tobago	213	589	302	.....	.....	.....	1,032	758	3,173	2,535	122	.....	1,113
Other British West Indies	.....	147	.....	.....	.....	.....	.....	.....	1,071	902	.....	.....	25
Cuba	1,379	7,907	3,261	94	31	98	32	42	56,287	39,132	12,863	2,560	1,639
Dominican Republic	.....	385	194	.....	.....	.....	264	238	2,149	2,413	83	.....	167
Dutch West Indies	200	.....	.....	.....	.....	.....	.....	.....	3,672	2,552	125	108	.....
French West Indies	.....	.....	.....	.....	.....	.....	.....	.....	338	267	.....	.....	200
Haiti	.....	28	11	.....	1	3	.....	.....	.....	.....	313	55	683
Virgin Islands of United States	.....	18	.....	.....	.....	.....	.....	.....	416	588	18	.....	.....
TOTALS, NORTH AMERICA	$26,856	$41,730	$12,426	$4,255	10,516	$29,678	4,200	$4,315	102,599	$80,008	$34,008	$25,801	$30,887
SOUTH AMERICA													
Argentina	$2,883	$2,094	$1,259	.....	.....	.....	.....	.....	31,414	$23,900	$1,687	$9,748	$6,231
Bolivia	2,050	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brazil	20,806	4,607	1,755	.....	.....	.....	.....	.....	.....	.....	3,962	1,684	3,108
Chile	3,591	4,726	1,167	.....	.....	.....	.....	.....	.....	.....	62	.....	1,037
Colombia	2,784	789	666	.....	.....	.....	561	$455	4,357	3,665	3,418	814	767
Ecuador	12	21	35	.....	.....	.....	.....	.....	2,131	1,714	.....	.....	.....
British Guiana	.....	.....	.....	.....	.....	.....	.....	.....	3,736	3,498	.....	.....	.....
Dutch Guiana	.....	4	.....	.....	.....	.....	.....	.....	180	176	.....	.....	.....
Paraguay	759	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peru	809	504	.....	.....	124	$881	48	67	590	566	283	234	452
Uruguay	210	217	51	.....	.....	.....	.....	.....	4,440	3,472	658	2,485	1,872
Venezuela	1,009	1,441	2,142	.....	.....	.....	.....	.....	.....	.....	1,663	1,464	442
TOTALS, SOUTH AMERICA	$34,913	$14,403	$7,075	.....	124	$881	609	$522	46,848	$36,991	$11,733	$16,429	$13,909
OCEANIA													
Philippine Islands	$506	$4,768	$932	.....	.....	.....	.....	.....	91,889	$72,641	$13,000	$275	$2,353
Australia	2,116	2,724	2,268	.....	.....	.....	.....	.....	.....	.....	3	11,270	3,949
British Oceania	.....	.....	.....	.....	.....	.....	.....	.....	607	845	.....	.....	.....
French Oceania	.....	26	.....	.....	.....	.....	.....	.....	622	790	74	.....	21
New Zealand	1,603	461	316	.....	396	$1,314	.....	.....	240	336	.....	2,269	450
Other Oceania	.....	.....	.....	.....	.....	.....	9	$12	725	1,020	.....	.....	30
TOTALS, OCEANIA	$4,225	$7,979	$3,516	.....	396	$1,314	9	$12	94,083	$75,632	$13,077	$13,814	$6,803
ASIA													
Aden	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British India	.....	$471	$611	.....	.....	.....	.....	.....	3,502	$4,540	.....	$407	.....
Ceylon	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	333	.....
Straits Settlements	.....	.....	86	.....	.....	.....	216	$155	248	193	.....	.....	.....
China	$275	583	254	.....	.....	.....	15,676	12,567	1	1	$27	137	$2,271
Chosen	.....	.....	105	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Java and Madura	396	.....	43	.....	.....	.....	100	81	.....	.....	.....	548	302
Other Dutch East Indies	.....	.....	153	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Far Eastern Republic	.....	.....	.....	.....	96	$240	.....	.....	.....	.....	.....	.....	.....
French Indo-China	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Greece in Asia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hejaz, Arabia, etc	.....	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hongkong	.....	272	627	.....	.....	.....	.....	.....	413	385	120	962	112
Japan	.....	2,906	4,078	$2,272	22,687	54,350	19,170	14,234	240	208	.....	676	1,917
Palestine and Syria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	362	.....
Siam	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Turkey in Asia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, ASIA	$671	$4,247	$5,957	$2,272	22,783	$54,590	35,162	$27,037	4,404	$5,327	$147	$3,425	$4,602

United States by Countries During July, 1922

Waterproofed Clothing Value	Pneumatic Casings: Automobile Number	Pneumatic Casings: Automobile Value	Pneumatic Casings: Others Value	Solid Tires: Automobile Value	Solid Tires: Others Value	Pneumatic Tubes: Automobile Number	Pneumatic Tubes: Automobile Value	Pneumatic Tubes: Others Value	Tire Repair Materials Value	Druggists' Rubber Sundries Value	Hard Rubber Goods: Battery Jars and Accessories Value	Hard Rubber Goods: Other Electrical Supplies Value	Hard Rubber Goods: Others Value	All Other Rubber Manufactures Value	Totals Value
.....	40	$654	.....	.....	.....	48	$110	.....	.....	.....	.....	.....	.....	.....	$764
.....	668	8,596	$1,190	.....	.....	137	288	$106	$385	$2,302	.....	.....	.....	$2,047	27,548
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	43
.....	4,917	67,043	1,319	$992	.....	3,745	7,634	226	1,774	1,848	.....	.....	.....	861	85,107
.....	103	1,905	.....	.....	.....	46	86	.....	.....	.....	.....	.....	.....	.....	3,972
.....	3,111	25,060	121	.....	.....	1,570	4,308	.....	5	4,879	$722	.....	$1,577	4,894	102,147
.....	32	901	291	.....	.....	32	95	58	.....	.....	.....	.....	.....	.....	1,361
.....	792	7,533	.....	.....	.....	162	371	.....	38	.....	.....	.....	.....	.....	7,942
.....	255	3,203	.....	.....	.....	265	515	.....	.....	.....	.....	.....	.....	.....	4,038
.....	28	425	.....	.....	.....	24	90	.....	.....	.....	.....	.....	.....	.....	4,244
.....	806	13,467	1,924	.....	.....	423	741	1,194	.....	438	.....	.....	.....	347	36,493
.....	222	2,856	.....	.....	.....	96	181	.....	.....	.....	.....	.....	.....	.....	3,942
.....	1,806	28,288	2,870	.....	.....	1,290	2,181	439	138	1,444	.....	.....	.....	1,303	39,565
$250	1,137	23,107	250	678	.....	879	2,035	38	313	.....	.....	.....	.....	361	33,795
.....	56	714	.....	.....	.....	130	421	.....	.....	.....	.....	.....	.....	.....	1,135
.....	427	7,396	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,746	10,652
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80
.....	90	838	.....	.....	.....	90	108	.....	.....	.....	.....	.....	.....	.....	946
.....	2,264	30,574	.....	2,596	.....	1,925	3,244	.....	50	.....	.....	$6	.....	229	49,852
.....	3,427	62,274	1,045	1,103	.....	3,101	8,008	378	424	2,053	.....	.....	8	923	83,591
46	404	5,406	308	.....	.....	400	885	50	.....	149	.....	.....	.....	1,060	15,869
.....	334	4,675	6	.....	.....	4	12	.....	14	.....	.....	.....	.....	.....	4,707
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	250
.....	39,299	345,936	2,613	11,441	.....	40,082	50,172	1,399	891	11,843	2,347	80	14,058	37,529	543,491
465	205	2,433	1,000	.....	.....	100	160	91	.....	400	.....	.....	.....	1,475	9,177
.....	576	8,959	.....	.....	.....	505	1,195	.....	.....	.....	.....	.....	.....	.....	10,154
.....	236	4,264	.....	.....	.....	224	497	.....	.....	.....	.....	.....	.....	22	4,783
$761	61,235	$656,507	$12,937	$16,810	.....	55,278	$83,337	$3,979	$4,032	$25,356	$3,069	$86	$15,643	$52,797	$1,085,648
.....	237	$3,262	.....	.....	.....	163	$319	$20	$167	$246	.....	.....	$44	$3,950	$10,432
$1,011	3,158	42,890	$5	$10,646	$50	4,977	7,220	59	3,624	16,359	$5,480	$3,773	7,683	53,841	213,258
742	448	4,415	7	752	.....	480	590	32	307	2,836	4,733	417	1,373	5,659	24,312
156	207	3,599	3	1,677	7	9	21	.....	72	124	16	.....	285	1,647	18,484
92	27	211	.....	.....	.....	30	53	.....	13	37	.....	.....	.....	85	2,317
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	37	.....	.....	.....	92	771
.....	349	7,999	.....	.....	334	144	455	.....	.....	33	.....	.....	163	70	12,831
520	47	1,420	.....	1,752	.....	92	228	.....	.....	33	.....	.....	12	84	6,656
.....	28	631	.....	.....	14	26	75	.....	.....	192	.....	.....	.....	11	2,712
14	542	6,767	34	292	300	104	205	.....	205	637	.....	6	58	412	17,994
.....	98	2,451	.....	1,265	.....	318	828	.....	14	85	.....	.....	.....	.....	6,217
6,902	6,655	70,645	4,431	2,404	507	5,780	10,124	234	1,630	2,525	.....	69	2,170	7,694	182,911
685	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,473
4,688	235	3,088	.....	.....	51	158	295	.....	.....	29	.....	.....	.....	552	30,162
.....	.....	.....	.....	.....	91	.....	.....	.....	.....	254	.....	.....	27	12	879
.....	75	979	.....	59	.....	78	134	.....	.....	.....	.....	16	.....	18	1,604
138	402	5,098	104	2,227	.....	406	591	.....	30	56	.....	.....	.....	985	16,501
.....	273	4,140	.....	710	195	288	574	.....	177	62	.....	28	.....	735	12,253
63	48	392	327	.....	148	13	35	100	.....	.....	.....	105	.....	21	2,265
2,148	8,160	93,058	667	13,959	1,885	8,926	16,792	335	2,068	2,930	.....	53	524	6,114	209,508
.....	401	7,272	78	417	173	780	2,306	20	135	22	.....	.....	.....	333	14,236
.....	170	1,829	52	38	.....	192	286	.....	29	.....	.....	.....	.....	48	5,267
.....	266	3,101	32	103	.....	213	446	.....	.....	.....	.....	.....	.....	33	4,182
.....	111	1,667	6	.....	.....	4	10	.....	9	.....	.....	.....	.....	34	2,819
.....	52	593	.....	52	.....	266	414	.....	18	.....	.....	.....	19	9	1,729
$17,159	21,989	$265,507	$5,746	$36,353	$3,755	23,447	$42,001	$800	$8,498	$26,497	$10,229	$4,467	$12,358	$82,439	$805,773
$113	6,859	$72,235	$176	$2,060	.....	3,356	$5,030	.....	$352	$4,828	.....	$425	$640	$5,784	$139,445
.....	148	3,306	.....	.....	.....	100	213	.....	.....	46	.....	.....	352	.....	5,967
90	2,838	35,954	.....	2,716	.....	1,145	1,932	.....	.....	898	.....	.....	3,485	816	81,813
.....	673	9,906	58	900	$527	309	631	$6	568	.....	.....	.....	.....	2,877	26,056
.....	390	7,879	164	160	633	828	1,217	.....	133	121	.....	.....	.....	301	2,996
.....	66	1,144	.....	46	.....	.....	.....	.....	.....	13	.....	.....	.....	11	23,966
172	30	575	10	.....	90	60	96	.....	18	.....	.....	.....	.....	164	4,623
.....	30	267	.....	.....	.....	72	74	.....	39	.....	.....	.....	.....	265	825
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	759
1,473	1,375	20,911	83	429	.....	1,169	2,397	66	123	40	.....	217	.....	739	30,274
887	1,776	23,736	25	.....	.....	580	1,065	.....	1,151	213	.....	.....	.....	542	36,584
.....	842	12,052	13	134	69	1,139	2,229	.....	66	360	.....	157	.....	669	23,910
$2,735	15,027	$187,965	$529	$6,445	$1,319	8,758	$14,884	$72	$2,450	$6,519	.....	$799	$4,477	$12,168	$377,218
$3,820	3,879	$61,739	$1,263	$7,080	$11,590	5,800	$9,655	$210	$1,234	$2,832	.....	$14	$713	$16,329	$210,954
.....	1,445	28,285	.....	7,740	.....	1,314	2,919	.....	987	2,737	.....	126	.....	2,215	67,339
.....	32	474	.....	95	.....	.....	.....	.....	.....	.....	.....	.....	.....	130	1,544
.....	57	852	95	.....	138	12	28	.....	55	.....	.....	.....	.....	138	2,217
.....	5,305	68,820	52	4,848	.....	2,176	4,695	.....	1,261	439	$721	.....	.....	1,647	89,232
120	53	868	.....	32	.....	42	74	.....	.....	11	.....	.....	.....	.....	2,167
$3,940	10,771	$161,038	$1,410	$19,795	$11,728	9,344	$17,371	$210	$3,537	$6,019	$721	$140	$713	$20,459	$373,453
.....	195	$2,103	.....	$60	.....	10	$12	.....	.....	.....	.....	.....	.....	.....	$2,175
.....	1,163	18,402	$750	7,563	.....	177	429	$40	$406	$502	.....	.....	$31	.....	34,152
.....	24	544	.....	80	.....	.....	.....	.....	.....	.....	.....	.....	.....	$262	1,219
.....	453	4,655	.....	928	.....	687	1,065	.....	15	33	$1,221	.....	.....	.....	8,351
.....	384	5,749	61	378	.....	254	523	10	26	1,068	648	.....	.....	526	25,104
.....	246	1,376	.....	.....	.....	284	852	.....	.....	9	.....	.....	.....	.....	2,342
.....	3,019	39,323	480	2,545	.....	1,683	3,470	175	.....	.....	.....	.....	.....	359	47,722
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	153
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	240
.....	115	1,527	.....	.....	.....	84	179	.....	294	.....	.....	.....	.....	.....	2,000
.....	4	93	.....	.....	.....	8	21	.....	.....	.....	.....	.....	.....	.....	114
.....	140	1,393	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,408
.....	65	1,314	50	752	.....	107	267	19	286	706	.....	$2,749	.....	40	8,861
.....	437	7,525	150	.....	.....	149	345	.....	85	955	.....	.....	.....	7,457	97,158
.....	926	10,472	.....	70	.....	967	1,537	.....	60	.....	.....	.....	.....	878	13,379
.....	40	442	.....	.....	.....	.....	.....	.....	.....	491	.....	.....	.....	.....	933
.....	.....	.....	.....	.....	.....	60	119	.....	.....	.....	.....	.....	.....	.....	119
.....	7,211	$95,118	$1,491	$12,376	.....	4,470	$8,819	$244	$1,172	$3,764	$1,869	$2,749	$31	$9,522	$245,430

Exports of India Rubber Manufactures from the United

	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Leather Cloth or Artificial Leather Value	Waterproofed and Auto Cloth and Auto Topping Value
AFRICA													
British West Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$224
British South Africa	$31,863	$23,811	$4,434	.....	.....	.....	1,506	$996	3,109	$2,423	$1,027	$2,772	444
British East Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	167	173
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	119	.....	.....
Egypt	.....	680	.....	.....	.....	.....	.....	.....	.....	.....	.....	620	.....
Other French Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portuguese East Africa	500	276	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, AFRICA	$32,363	$24,767	$4,434	.....	.....	.....	1,506	$996	3,109	$2,423	$1,146	$3,559	$841
GRAND TOTALS	$116,588	$108,347	$39,974	$75,514	35,897	$92,587	57,545	$42,102	260,662	$208,164	$61,768	$130,727	$66,559

Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

Official India Rubber Statistics for the United States

Imports of Crude and Manufactured Rubber

	June 1921 Pounds	June 1921 Value	June 1922 Pounds	June 1922 Value
UNMANUFACTURED—*free*				
India rubber				
From France	.....	.....	25	$5
Netherlands	941,378	$174,884	417,991	57,387
Portugal	.....	.....	.....	.....
United Kingdom	1,357,917	211,549	2,330,730	367,132
Canada	.....	.....	.....	.....
Central America	.....	.....	3,875	804
Mexico	.....	.....	.....	.....
Brazil	2,215,989	242,286	1,646,065	195,793
Peru	22,594	2,431	330	40
Other South America	409,236	46,867	51,710	7,468
British East Indies	25,546,836	4,379,361	41,377,918	5,947,399
Dutch East Indies	3,793,568	732,174	5,041,231	835,079
Other countries	337,230	42,265	82,149	11,007
Totals	34,624,748	$5,831,817	50,952,024	$7,422,114
Balata	124,832	72,661	137,242	86,256
Jelutong (Pontianak)	249,236	11,541	557,282	51,183
Gutta percha	217,231	29,563	298,778	46,107
Guayule	.....	.....	.....	.....
Rubber scrap	298,941	5,507	40,812	2,285
Totals, unmanufactured	35,514,988	$5,951,089	51,986,138	$7,607,945
Chicle ..... *dutiable*	727,671	409,212	417,952	219,611
MANUFACTURED—*dutiable*				
India rubber and gutta percha	.....	$81,608	.....	$183,639
India rubber substitutes	.....	.....	.....	1,006

Exports of Domestic Merchandise

	June 1921 Pounds	June 1921 Value	June 1922 Pounds	June 1922 Value
MANUFACTURED				
India rubber				
Reclaimed	46,323	$6,103	259,751	$23,512
Scrap and old	421,643	22,724	778,571	25,259
Footwear				
Boots[1] ..... *pairs*	10,296	29,227	25,170	67,271
Shoes[1] ..... *pairs*	88,795	106,236	69,153	46,383
Canvas shoes with rubber soles[1] ..... *pairs*	.....	.....	308,744	227,986
Druggists' rubber sundries[1]	.....	48,685	67,005	76,316
Hard rubber goods				
Battery jars and accessories[1]	.....	.....	36,099	12,483
Other electrical supplies[1]	.....	.....	18,835	10,137
Other hard rubber goods[1]	.....	.....	35,494	38,154
Tires				
Pneumatic casings				
For automobiles[1] ..... *number*	.....	758,581	125,353	1,626,861
Other[1]	.....	.....	10,183	39,011
Pneumatic tubes				
For automobiles[1] ..... *number*	.....	60,620	77,370	152,642
Other[1]	.....	.....	6,034	7,530
Solid tires				
For automobiles and motor trucks[1]	.....	138,015	4,738	143,265
Other[1]	.....	.....	85,161	28,233
All other tires[1]	.....	30,915	.....	.....
Tire repair materials[1]	.....	.....	85,598	37,053

[1]Details of exports of domestic merchandise by countries during June, 1922, appeared on pages 850-853 of our September issue.

	June 1921 Pounds	June 1921 Value	June 1922 Pounds	June 1922 Value
Belting[1]	.....	118,327	148,065	82,413
Hose[1]	.....	76,542	331,193	125,456
Packing[1]	.....	35,979	102,948	39,805
Soles and heels[1]	.....	30,483	146,567	59,339
Thread[1]	.....	.....	89,235	112,160
Other rubber manufactures[1]	.....	403,421	389,358	197,943
Totals, manufactured	.....	$1,865,795	.....	$3,179,212

Exports of Foreign Merchandise

	June 1921 Pounds	June 1921 Value	June 1922 Pounds	June 1922 Value
UNMANUFACTURED				
India rubber	735,122	$132,196	452,711	$68,945
Balata	5,326	2,623	12,000	6,000
Jelutong (Pontianak)	.....	.....	.....	.....
Totals, unmanufactured	740,448	$134,819	464,711	$74,945
MANUFACTURED				
Gutta percha and india rubber	.....	$9	.....	$896
India rubber substitutes	.....	.....	22,400	11,000
Totals, manufactured	.....	$9	22,400	$11,896

Custom House Statistics

New York

Imports

	July 1921 Pounds	July 1921 Value	July 1922 Pounds	July 1922 Value
UNMANUFACTURED—*free*				
Crude rubber				
From Belgium	64,052	$1,268	179,250	$17,956
France	11,356	2,019	6,036	1,403
Italy	.....	.....	22,020	2,424
Netherlands	323,106	40,365	923,272	170,934
Portugal	31,717	5,843	.....	.....
England	3,347,596	415,510	1,766,745	264,739
Quebec	.....	.....	5,000	654
Panama	11,400	1,164	.....	.....
Brazil	1,482,037	116,275	1,469,643	149,404
Chile	.....	.....	58,177	8,782
Colombia	10,270	1,635	25,443	3,216
Peru	78,582	11,318	.....	.....
Uruguay	.....	.....	4,112	1,040
China	56,000	7,000	.....	.....
British India	151,200	36,192	45,669	7,818
Ceylon	.....	.....	5,069,760	767,974
Straits Settlements	17,772,105	2,923,879	36,144,360	5,252,130
Java	.....	.....	3,216,886	485,721
British East India	1,472,757	173,456	.....	.....
Dutch East India	1,976,089	340,946	5,519,476	790,994
Japan	.....	.....	604,800	81,035
Philippine Islands	23,540	3,000	.....	.....
Totals	26,811,807	$4,079,870	55,060,649	$8,006,224
Balata	139,508	89,302	128,068	72,306
Jelutong (Pontianak)	4,263	449	43,721	4,710
Gutta percha	114,871	23,419	172,104	37,392
Totals	27,070,449	$4,193,040	55,404,542	$8,120,632
Rubber, scrap and reclaimed	69,904	1,318	75,275	2,238
Totals, unmanufactured	27,140,353	$4,194,358	55,479,817	$8,122,870

States by Countries During July, 1922—*Continued*

	Pneumatic Casings			Solid Tires		Pneumatic Tubes					Hard Rubber Goods				
	Automobile			Automobile		Automobile									
Waterproofed Clothing Value	Number	Value	Others Value	Value	Others Value	Number	Value	Others Value	Tire Repair Materials Value	Druggists' Rubber Sundries Value	Battery Jars and Accessories Value	Other Electrical Supplies Value	Others Value	All Other Rubber Manufactures Value	Totals Value
.....	282	$4,924	.....	.....	.....	560	$1,039	.....	.....	$23	.....	.....	.....	$115	$6,325
$675	3,495	33,190	$890	$387	.....	960	1,684	$151	$1,424	408	.....	.....	.....	3,299	109,878
.....	395	4,953	.....	.....	.....	235	448	.....	.....	14	.....	.....	.....	.....	5,755
.....	52	515	.....	.....	.....	50	88	.....	128	.....	.....	.....	.....	.....	850
.....	792	6,506	115	70	.....	560	1,113	.....	13	.....	.....	.....	.....	742	9,859
.....	45	697	.....	.....	.....	38	69	.....	.....	.....	.....	.....	.....	.....	766
.....	.....	.....	.....	.....	.....	72	270	.....	.....	.....	.....	.....	.....	8	1,054
.....	24	587	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	587
$675	5,085	$51,372	$1,005	$457	.....	2,475	$4,711	$151	$1,565	$445	.....	.....	.....	$4,164	$135,074
$25,270	121,318	$1,417,507	$23,118	$92,236	$16,802	103,772	$171,123	$5,456	$21,254	$68,600	$15,888	$8,241	$33,222	$181,549	$3,022,596

Custom House Statistics—*Continued*

	July			
	1921		1922	
	Pounds	Value	Pounds	Value
MANUFACTURED				
Manufactures of rubber and gutta percha .....*dutiable*	.....	$53,951	.....	$78,518
Rubber substitutes ..*dutiable*	.....	.....	.....	.....
Chicle .....*dutiable*	214,081	96,272	184,787	88,620
Exports				
MANUFACTURED				
Rubber, scrap and reclaimed.	.....	.....	185,205	$9,327
Automobile and other tires, *number*	.....	$822,820	104,215	1,157,223
Inner tubes .....*number*	.....	65,519	76,847	133,792
Tire repair materials.....	.....	.....	24,887	11,358
Boots and shoes.....*pairs*	154,269	182,091	57,673	82,445
Canvas shoes with rubber soles .....*pairs*	.....	.....	157,259	125,436
Soles and heels	.....	27,787	104,487	42,375
Battery jars and accessories.	.....	.....	10,459	2,568
Other electrical supplies....	.....	.....	6,571	3,911
Other hard rubber goods....	.....	.....	25,402	21,929
Druggists' rubber sundries..	.....	27,518	38,077	44,844
Belting, hose and packing..	.....	170,632	414,592	167,708
Thread	.....	.....	42,863	53,368
Other rubber manufactures.	.....	187,440	163,553	94,451
Totals, manufactured...	.....	$1,483,807	.....	$1,950,735
Foreign Exports				
Crude rubber	33,900	$1,690	15,068	$2,004
Balata	2,200	704	9,051	4,970
Gutta percha	.....	.....	.....	.....
Rubber, scrap and reclaimed.	.....	.....	.....	.....
Rubber manufactures	.....	490	.....	125
Chicle	.....	.....	.....	.....

Imports of Crude Rubber into the United States by Customs Districts

	July, 1921		July, 1922	
	Pounds	Value	Pounds	Value
Vermont	.....	.....	3,170	$539
Buffalo	30,624	$3.369	.....	.....
New York	26,811,807	4,079,870	55,060,649	8,006,224
Maryland	280,000	37,108	.....	.....
San Diego	35,581	16,719	.....	.....
Philadelphia	.....	.....	2,165	87
Los Angeles	489,862	77,393	430,220	60,453
San Francisco	.....	.....	190,500	23,827
Chicago	.....	.....	349	134
Colorado	.....	.....	168,000	29,927
Massachusetts	.....	.....	999,705	138,563
Totals	27,647,874	$4,214,459	56,854,758	$8,259,754

Plantation Rubber Exports from Java and Madura*

	June		Six Months Ended June 30	
	1921	1922	1921	1922
To Netherlands .....*kilos*	405,000	235,000	3,751,000	2,160,000
Great Britain.....	1,061,000	678,000	5,387,000	3,063,000
Germany	11,000	62,000	180,000	410,000
France	.....	23,000	.....	106.000
Italy	14,000	15,000	20,000	40,000
United States.....	500,000	2,017,000	3,413,000	7,587,000
Singapore	180,000	172,000	1,518.900	1,527,000
Japan	.....	.....	95.000	69,000
Australia	.....	.....	211,000	93,000
Other countries.....	.....	.....	.....	11,000
Totals.....*kilos*	2,171,000	3,202,000	14,575,000	15,066,000
Ports of origin:				
Tandjong Priok.....*kilos*	801,000	1,072,000	6,293,000	5,953,000
Samarang	61,000	95,000	274,000	315,000
Soerabaya	1,022,000	1,930,000	6,621,000	7,787.000

* The May figures are verified.

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber

	June			
	1921		1922	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*free*				
Rubber, gutta percha, etc.				
From United Kingdom.....	54,596	$8,037	239,671	$35,722
United States	744,054	186,887	558,015	82,861
Belgium	.....	.....	22,220	2,708
British East Indies				
Ceylon	.....	.....	224,000	36,786
Straits Settlements....	219,535	42,578	542,143	79,655
Dutch East India.....	.....	.....	22,274	3,462
Total	1,018,185	$237,502	1,608,323	$241,194
Rubber, recovered.....	50,649	7,395	135,699	12,056
Rubber, powdered, and rubber or gutta percha scrap.....	34,822	716	279,325	9,633
Balata	.....	.....	10,584	1,603
Rubber substitutes.....	70,859	9,311	26,603	4,415
Totals, unmanufactured.....	1,174,515	$254,924	2,060,534	$268,901
PARTLY MANUFACTURED				
Hard rubber sheets and rods....	215	$439	1,951	$922
Hard rubber tubes.....	.....	3,905	.....	2,314
Rubber thread, not covered.. ..	2,616	3,566	5,321	6,079
Totals, partly manufactured.	2,831	$7,910	7,272	$9,315
MANUFACTURED				
Belting	.....	$7,451	.....	$8,290
Hose	.....	9,984	.....	13,439
Packing	.....	3,977	.....	3,722
Boots and shoes.....*pairs*	.....	5,726	679	2,302
Clothing, including waterproofed.	.....	11,544	.....	13,991
Gloves	.....	1,098	.....	1,461
Hot water bottles.....	.....	72	.....	215
Tires, solid.....	.....	6,251	.....	18,220
Tires, pneumatic.....	.....	112,957	.....	125,701
Inner tubes.....	.....	10,199	.....	15,344
Elastic, round or flat.....	.....	37,639	.....	33,468
Mats and matting.....	.....	138	.....	700
Cement	.....	3,300	.....	6,859
Other rubber manufactures.....	.....	92,261	.....	121,399
Totals, manufactured.....	.....	$302,597	.....	$365,111
Totals, rubber imports.....	1,177,346	$565,431	2,068,485	$643,327

Exports of Domestic and Foreign Rubber Goods

	June			
	1921		1922	
	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
UNMANUFACTURED				
Crude and waste rubber.....	$3,160	$38	$792	.....
MANUFACTURED				
Belting	$2,107	.....	$23,629	.....
Canvas shoes with rubber soles..	11,756	.....	75,372	.....
Boots and shoes.....	9,425	.....	10.669	.....
Clothing, including waterproofed.	742	.....	1,948	.....
Hose	9,531	.....	10.661	.....
Tires, casings.....	.....	.....	332,803	.....
inner tubes.....	.....	.....	26,047	.....
pneumatic	141,871	.....	.....	.....
solid	3,518	.....	11,125	.....
vehicle	.....	$4,220	.....	$1,022
Other rubber manufactures.....	7,750	2,215	28,728	1,569
Totals, manufactured.....	$186,700	$6,435	$520,982	$2,591
Totals, rubber exports.....	$189,860	$6,473	$521,774	$2,591

United Kingdom Rubber Statistics

Imports

	July 1921 Pounds	July 1921 Value	July 1922 Pounds	July 1922 Value
UNMANUFACTURED				
Crude rubber				
From—				
Straits Settlements	4,776,200	£177,013	1,748,100	£69,082
Federated Malay States	4,528,000	180,491	3,942,800	175,906
British India	962,900	48,039	660,100	27,736
Ceylon and Dependencies	1,609,400	60,662	1,417,900	57,992
Other Dutch Possessions in Indian Seas	1,402,700	55,999	452,900	19,084
Dutch East Indies (except other Dutch Possessions in Indian Seas)	1,697,700	63,326	1,099,600	44,141
Other countries in East Indies and Pacific not elsewhere specified	169,900	6,697	109,300	4,042
Brazil	452,400	15,149	267,100	9,925
Peru	.....	.....	.....	.....
South and Central America (except Brazil and Peru)	5,600	255	.....	.....
West Africa				
French West Africa	.....	.....	.....	.....
Gold Coast	2,700	108	.....	.....
Other parts of West Africa	14,600	393	51,500	1,630
East Africa (including Madagascar)	.....	.....	13,300	420
Other countries	19,300	735	3,200	118
Totals	15,641,400	£608,867	9,765,800	£410,076
Waste and reclaimed rubber	77,200	1,060	48,900	507
Gutta percha and balata	220,600	26,885	141,600	21,344
Rubber substitutes	11,400	441	22,400	700
Totals, unmanufactured	15,950,600	£637,253	9,978,700	£432,627
MANUFACTURED				
Boots and shoes *dozen pairs*	2,923	£7,253	8,268	£15,107
Tires and tubes *number*	130,441	354,536	318,894	374,663
Other rubber manufactures	.....	54,360	.....	77,474
Totals, manufactured	.....	£416,149	.....	£467,244
Waterproof clothing, *number*	307	£309	421	£394
Insulated wire	.....	3,975	.....	4,223
Submarine cables	.....	.....	.....	.....

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	365,900	£6,208	186,500	£2,758
Rubber substitutes	18,200	489	44,700	1,017
Totals, unmanufactured	384,100	£6,697	231,200	£3,775
MANUFACTURED				
Boots and shoes *dozen pairs*	2,224	£5,485	13,356	£23,947
Tires and tubes *number*	103,476	107,680	186,922	152,637
Other rubber manufactures	.....	151,333	.....	208,393
Totals, manufactured	.....	£264,498	.....	£384,977
Waterproof clothing *number*	46,758	£74,093	61,909	£80,424
Insulated wire	.....	66,499	.....	64,385
Submarine cables	.....	338,208	.....	24,110

Exports—Colonial and Foreign

UNMANUFACTURED				
Crude rubber				
To Russia	30,300	£1,800	.....	.....
Sweden, Norway and Denmark	46,500	2,459	51,300	£1,746
Germany	993,900	31,626	1,222,300	44,380
Belgium	241,200	9,672	135,000	5,081
France	1,803,600	66,260	2,285,600	77,807
Spain	18,300	855	34,300	1,201
Italy	367,500	12,700	528,200	17,974
Austria	31,200	2,146	11,200	324
Other European countries	209,100	5,928	102,700	3,344
United States	3,559,000	141,929	1,367,000	44,950
Canada	.....	.....	300,100	10,607
Other countries	.....	.....	98,500	4,595
Totals	7,300,600	£273,375	6,136,200	£212,009
Waste and reclaimed rubber	.....	.....	.....	.....
Gutta percha and balata	55,800	£7,181	46,900	£4,421
Rubber substitutes	3,900	.....	.....	.....
Totals, unmanufactured	7,360,300	£280,556	6,183,100	£216,430
MANUFACTURED				
Boots and shoes *dozen pairs*	263	£646	347	£1,697
Tires and tubes *number*	4,769	28,954	6,109	19,174
Other rubber manufactures	.....	2,246	.....	3,420
Totals, manufactured	.....	£31,846	.....	£24,291
Waterproof clothing *number*	.....	.....	.....	.....
Insulated wire	.....	.....	.....	£6
Submarine cables	.....	.....	.....	.....

The Market for Rubber Scrap

New York

There has been very little activity in rubber scrap during the past month. Reclaimers' interest is not active and is confined chiefly to boots and shoes at very low prices. Prices offered by the export trade are too low for consideration. Contracts for No. 1 inner tubes have been filled and there remains very little business in that grade. There is a mild interest in mixed tubes but none at all in tires. There is no market value for mechanical scrap. As for many months past, the rubber scrap dealers are looking to a hoped-for-rise in crude rubber to start interest of the reclaimers in scrap grades.

Quotations for Carload Lots Delivered

September 25, 1922

Prices subject to change without notice

Boots and Shoes			
Boots and shoes, black	*lb.*	*$0.02¾ @	$0.02¾
Trimmed arctics	*lb.*	.02 @	
Untrimmed arctics	*lb.*	.01¾ @	
Hard Rubber			
Battery jars, black compound	*lb.*	*.01 @	
glossy	*lb.*	.05 @	.06
Inner Tubes			
No. 1	*lb.*	*.03¼ @	.04
Compounded	*lb.*	.02¾ @	.03
Red	*lb.*	.03 @	
Mechanicals			
Black scrap, mixed	*lb.*	*.01½ @	
Heels	*lb.*	*.02½ @	.03
Horse-shoe pads	*lb.*	*.02½ @	.03
Hose, air brake	*lb.*	*.01 @	.01½
regular	*lb.*	*.01 @	
Red scrap, mixed	*lb.*	*.07 @	.08
White scrap, mixed	*lb.*	*.07 @	.07½
Tires			
PNEUMATIC—			
Auto peelings	*lb.*	*.00⅞	
Bicycle	*lb.*	.01 @	.01¼
Standard white auto	*lb.*	*.02¼ @	.02¾
Mixed auto	*lb.*	.00¾ @	.01
Stripped, unguaranteed	*lb.*	*.01 @	.01½
SOLID—			
Carriage	*lb.*	*.02¼ @	.02¾
Irony	*lb.*	@	
Truck, clean	*lb.*	*.01¼ @	.01½

*Nominal.

MANUFACTURE OF RUBBER BOOTS AND SHOES

The Department of Commerce announces that the census reports show a decrease in the manufacture of rubber boots and shoes during 1921 as compared with 1919. The returns from 24 establishments reporting indicate that the combined output of all establishments was approximately 66 per cent of the maximum capacity, based upon a demand requiring full running time.

There are eight plants in Massachusetts, five in Connecticut, three in Rhode Island, two in New Jersey and one each in Indiana, Maine, Missouri, New York, Pennsylvania, and Wisconsin. Massachusetts reports 39.1 per cent of total wage earners and 39.2 per cent of total value of products.

RUBBER BOOTS AND SHOES, 1921 AND 1919

	1921	1919	Per Cent of Increase
Establishments	24	24	....
Persons engaged in the industry	27,437	37,929	—27.7
Salaries and wages	$28,964,473	$38,284,000	—24.3
Cost of materials	32,132,942	50,346,880	—36.0
Value of products	93,625,659	116,917,434	—19.9

COMPARISON OF PAIRS AND VALUE OF RUBBER BOOTS AND SHOES

	1921 Pairs	1921 Value	1919 Pairs	1919 Value	Per Cent of Increase Pairs	Per Cent of Increase Value
Totals	102,031,650	$86,910,362	96,406,522	$116,018,585	5.8	—25.1
Boots, rubber	7,253,668	13,761,669	9,207,203	26,066,647	—21.2	—47.2
Shoes, rubber	75,944,486	54,231,646	66,145,541	64,713,182	14.8	—16.2
Shoes, canvas, with rubber soles	18,630,170	18,885,487	21,034,664	25,176,684	—11.4	—25.0

The Market for Cotton and Other Fabrics

New York

AMERICAN COTTON. The advance in spot prices preceding the beginning of September reached 23 cents and fluctuations became irregular, reports of deterioration holding selling in check. Late August reports indicate the new crop at not over and probably below 11,000,000 bales. Hope for increased production is contingent on September weather. Prices declined as the month progressed due to crop figures reported by the government. Cotton is in good demand by merchants and shippers in anticipation of trade. Domestic mill consumption for August was 527,000 bales as against 458,000 bales for July which is considered favorable. Southern reports confirm indications of scarcity of the crop. Stocks of raw cotton abroad are small and it is likely that within the next month there will be considerable increase in the export movement.

EGYPTIAN COTTON. All staples of cotton of late have been showing a tendency toward a lower basis. Egyptian Uppers are now particularly attractive. Reports from Egypt indicate that the crop there is making favorable progress and early receipts are apparently satisfactory in both quality and staple.

The prediction that the imposition of a tariff on long staple cotton would cause a radical decline in Egyptian prices and react upon the shorter domestic staples has been confirmed by subsequent developments. It is now possible to buy Sak of good quality at least three cents below the price of spot and new crop hard western strict middling 1¼-inch cotton. Egyptian Uppers can be purchased around 25⅞ cents and medium grade Sakel can be landed in Boston for about 34 cents, not including duty.

SEA ISLAND. Sea Islands are moving very slowly and early receipts leave much to be desired. Ideas of price seem to run from 42 to 45 cents basis of extra choice.

ARIZONA COTTON. The demand for Pima cotton is fairly good. The present new crop shows very favorably and has been grown under excellent weather conditions. The estimated yield is approximately 40,000 bales. The stock of old cotton in Arizona is not over 4,000 bales unsold and not over 15,000 bales in the eastern market. This makes a strong position for the new crop. There is some feeling that the tire industry will again become large users of this character of cotton. There is apparently enough demand to absorb all offerings on a basis of 36 cents for No. 2's.

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. The market is strong and active. Prices firm and moving forward. Further advance over prices now being demanded are based on activity in sales of fabric for spot and future delivery. The cloth market is no longer dependent on rise in cotton solely to sustain selling prices.

RAINCOAT FABRICS. Business in these goods has improved considerably the past month and a steady increase of sales is confidently anticipated.

SHEETINGS. The market is quite firm and very active with prices showing tendency to advance. Many buyers have covered their requirements up to the end of the year.

HOLLANDS. The demand in the rubber trade is slow, but good in other lines.

TIRE FABRICS. This market has been generally quiet and routine in character. Prices are demoralized and expected improvement depends on textile situation for more balanced condition in tire fabric prices.

"PNEUMATIC TIRES," BY HENRY C. PEARSON, CONTAINS THREE chapters of valuable information on pneumatic tire fabrics. First edition now ready for mailing.

New York Quotations

September 25, 1922

Prices subject to change without notice

Burlaps			
40—7-ounce	100 yds.	$6.55	@$6.50
40—7½-ounce		6.75	@ 6.80
36—8-ounce		6.65	@ 6.70
40—8-ounce		6.80	@ 6.85
40—10-once		8.95	@ 9.00
40—10½-ounce		9.15	@ 9.20
Drills			
38-inch 2.00-yard	yard	.20	@
40-inch 3.47-yard		.12⅛	@
52-inch 1.90-yard		.22½	@
60-inch 1.52-yard		.28	@
Duck			
CARRIAGE CLOTH			
38-inch 2.00-yard enameling duck	yard	.20¼	@
40-inch 1.47-yard		.27¼	@
72-inch 16.66-ounce		.46⅞	@
72-inch 17.21-ounce		.48⅜	@
MECHANICAL			
Hose	pound	.42	@
Belting		.41	@
Osnaburgs			
40-inch 2.35-yard		.17⅛	@
40-inch 2.48-yard		.16⅛	@
37½-inch, 2.42-yard		.16⅜	@
Hollands			
DULL FINISH			
Standard, 37-inch, white and colors		.18	@
42-inch, white and colors		.22	@
FLAT FINISH			
Imperial, 36-inch, white and colors		.14	@
40-inch, white and colors		.17	@
Raincoat Fabrics			
COTTON			
Bombazine 64 x 60	yard	.12	@
60 x 48		.11½	@
Cashmeres, cotton and wool, 36-inch, tan		.50	@
Plaids 60 x 48		.12¼	@
56 x 44		.11¾	@
Surface prints 60 x 48		.12¼	@
64 x 60		.13	@
Sheetings, 40-inch			
48 x 48, 2.50-yard	yard	.14¼	@
48 x 48, 2.85-yard		.12¼	@
64 x 68, 3.15-yard		.13½	@
56 x 60, 3.60-yard		.11¾	@
48 x 44, 3.75-yard		.10¼	@
Silks			
Canton, 38-inch	yard	.29½	@
Schappe, 36-inch		.45	@
Tire Fabrics			
BUILDING			
17¼-ounce Sakellaridis, combed	pound	.80	@
17¼-ounce Egyptian, combed		.60	@ .70
17¼-ounce Egyptian, carded		.58	@ .63
17¼-ounce Peeler, combed		.60	@ .70
17¼-ounce Peeler, carded		.50	@ .55
CORD			
15-ounce Egyptian, combed	pound	.70	@ .73
15-ounce Egyptian, carded		.60	@ .65
BICYCLE			
8-ounce American	pound		@
10-ounce American			@
CHAFER			
9¼-ounce Egyptian, carded	pound	.66	@ .71
9¼-ounce Peeler, carded		.55	@

GOOD FABRIC TIRES BETTER THAN POOR CORDS

Taking advantage of the fact that cord tires are supposed to be better than fabric, unscrupulous manufacturers have been recently turning out flimsy products, under the name of cords, and incidentally have been reaping a considerable harvest as a result.

Motorists should realize that the art of building good fabric tires has been progressing along with increasing skill in building good cords, and that a good fabric tire, as produced by a reputable manufacturer, is immeasurably better than a poor cord.

The Market for Chemicals and Compounding Ingredients

New York

THE industrially disturbing factors, the railway and coal strikes, which have grievously interfered with the business of the country in all lines have now measurably ceased to act. Shortage of railway motive power rather than cars seems to be the cause of poor transportation service in the West and more especially in the South where the movement of gas black, clays, barytes, etc., is much hampered. Business in most lines is good and in some, demand cannot be fully met because of short supply due to strikes now past or passing.

The new rates of tariff now in force may cause appreciable changes upward in some of the quotations listed below. The effect is not apparent in detail.

ANILINE. The market has been firm and prices steady most of the time with good demand. After the middle of the month there was an advance in price due to increase in cost of production.

ANTIMONY SULPHURET. Prices nominal and trade dull.

BARYTES. Railway movements on this material from the South are improving. Consumption is liberal and the market steady. Announcement has been made that no advance in price will be made on the basis of the new tariff.

BENZOL. Production remains curtailed. Supplies are short and the situation unsatisfactory. Prices, however, remain unchanged.

BLANC FIXE. Deliveries are improving. The supply is inadequate to the demand. Prices have not advanced.

CARBON BISULPHIDE. Supplies continue light because of its seasonal use as an insecticide for wheat.

CARBON BLACK. Carbon black is abundant at its far distant or inaccessible sources of production. The material is called for so strenuously by makers of tires, paint and printers' ink that producers find it quite difficult to meet the requirements. In spite of this the prices have not advanced.

CARBON TETRACHLORIDE. The market remains strong and steady and supplies light.

CHINA CLAY. Transportation relief has been sought from southern mining points by river and coastwise transport to seaboard rail centers for shipments to points West. Both foreign and domestic grades are in good request. The price of the imported has advanced $1.25 per ton.

DRY COLORS. Business in these lines has continued good. The new tariff will later cause advances in price on many colors.

LITHARGE. Throughout the month the market has been steady with fair business. In the last week prices were advanced as follows: for litharge in casks ½-cent, and in kegs ¼-cent, per pound.

LITHOPONE. Raw materials have gone up in price. The trade movement is very active and product is sold ahead at prices that will remain fixed the remainder of the year.

SOLVENT NAPHTHA. This material is somewhat scarce compared with users' needs and prices are steady.

SUBLIMED LEAD. Sales increased during the whole month, followed by an advance of ¼-cent in the price a pound.

SULPHUR. Steady routine business without increase of price or notable feature.

SULPHUR CHLORIDE. Not active and no fluctuation in price.

TALC. Imported grades advanced by the new tariff. Both foreign and domestic in active request.

WHITING. Consumption requirements are liberal at steady prices.

ZINC OXIDE. The normal consumption of zinc oxide has been gradually diminished as the month progressed owing to season reduction of tire output. Prices have not advanced with the increase of price of spelter.

Accelerators, Organic

Accelerene (f. o. b. English port)	lb.	13r.	
Adco	lb.	$0.54	
Aldehyde ammonia crystals	lb.	.90 @	.95
Aniline (f. o. b.) factory	lb.	.14 @	.17
Diphenyl guanidine	lb.	1.30 @	1.40
Ethylidene aniline	lb.	.80	
Excellerex	lb.	.35 @	.40
Formaldehyde aniline	lb.	.45 @	.50
Hexamethylene tetramine	lb.	.72½ @	.75
Lead oleate (bbls.)	lb.	.14	
Methylene aniline	lb.	.40	
N. C. C.	lb.		
No. 999	lb.	.14	
Paradin	lb.	.38	
Paraphenylene diamine	lb.	1.55 @	1.57
Super-sulphur, No. 1	lb.	.50 @	.60
No. 2	lb.	.25 @	.30
Super-X	lb.	.50	
Super-XX	lb.	.80	
Thiocarbanilide	lb.	.28 @	.30
Vul-Ko-Cene	lb.	.35	
XLO	lb.	1.20	

Accelerators, Inorganic

Lime, flour, superfine	lb.	.02 @	.02½
Litharge, domestic	lb.	.08½ @	
imported	lb.	*.17	
Magnesia, carbonate, light	lb.	.07½ @	.08
calcined, light (bbls.)	lb.	.23 @	.24
calcined, ex. light (bbls.)	lb.	.45	
calcined, md. light (bbls.)	lb.	.15	
calcined, heavy (bbls.)	lb.	.05 @	.05½
oxide	lb.	.05½ @	.06

Acids

Acetic 28% (bbls.)	cwt.	2.80 @	3.05
glacial, 99%	cwt.	10.71 @	10.46
Cresylic (97% straw color)	gal.	.56 @	.58
(95% dark)	gal.	.51 @	.53
Muriatic, 20 degrees	cwt.	1.10 @	1.25
Nitric, 36 degrees	cwt.	4.75 @	5.25
Sulphuric, 66 degrees	ton	15.00 @	16.00

Alkalies

Caustic soda	cwt.	3.50 @	3.75
Soda ash, 58% (bbls.)	cwt.	1.95 @	2.30

*Nominal.

New York Quotations

September 25, 1922

Prices subject to new tariff revision

Colors

BLACK

Bone, powdered	lb.	$0.05½ @	$0.07½
Carbon black	lb.	.16 @	.22
pressed	lb.	.17	
Dipped goods	lb.	1.00	
Drop	lb.	.07½ @	.16
Hyposulphite of lead	lb.	.25 @	.30
Iron oxide	lb.	.04½ @	.16
Ivory black	lb.	.15 @	.45
Lampblack	lb.	.12 @	.40
Micronex	lb.	.17 @	.24
Gritless black	lb.	.40	

BLUE

Dipped goods	lb.	1.00	
Prussian	lb.	.55 @	.60
Gritless blue	lb.	3.50	
Ultramarine	lb.	.10 @	.35

BROWN

Iron oxide	lb.	.05 @	.06
Sienna, Italian	lb.	.04¼ @	.05¼
Umber, Turkey	lb.	.05 @	.06
Vandyke	lb.	.06 @	.07

GREEN

Chrome, light	lb.	.30 @	.32
medium	lb.	.35 @	.36
dark	lb.	.36 @	.45
commercial	lb.	.12	
tile	lb.	.11 @	.13
Guignet	lb.	1.50	
Dipped goods	lb.	1.00	
Oxide of chromium	lb.	.55	
Gritless green	lb.	3.50	

RED

Antimony, crimson	lb.	$0.34 @	$0.40
crimson, 15/17% free	lb.	.36 @	.44
crimson, R.M.P. No. 3	lb.	.48 @	
crimson F	lb.	.35	
Antimony, golden	lb.	.17 @	.21
golden R.M.P. No. 7	lb.	.20	
golden, 15/17% free	lb.	.17 @	.22
golden, No. 1	lb.	.30	
golden, No. 2	lb.	.25	
7-A	lb	.35	
vermilion	lb.	.55	
red sulphuret	lb.	.20	
Arsenic sulphide, red	lb	.12 @	.13
lemon	lb.	.75 @	1.00
orange	lb.	.75 @	1.00
Cadmium sulphide	lb.	1.85	
cold cure	lb.	1.70 @	1.85
hot cure	lb.	1.40 @	1.55
Dipped goods red	lb.	1.00	
purple	lb.	1.00	
orange	lb.	1.00	
Indian	lb.	.08 @	.12
Indian maroon, English	lb.	.11 @	.13
Iron oxide, reduced grades	lb.	.12	
pure bright	lb.	.14	
Maroon oxide	lb.	.08 @	.12
Red oxide, crimson	lb.	.05½ @	.06
English	lb.	.12 @	.14
Spanish	lb.	.03½ @	.05
Oximony	lb.	.16	
Para toner	lb.	1.10 @	1.20
Gritless red (four shades)	lb.	3.50	
purple	lb.	2.50	
Spanish natural	lb.	.03½ @	.04½
Toluidine toner	lb.	2.25 @	2.50
Venetian	lb.	.03½ @	.06
Vermilion, American	lb.	.25 @	.30
English quicksilver	lb.	1.35 @	1.45

WHITE

Albalith	lb.	.06 @	.06½
Aluminum bronze	lb.		
Lithopone, domestic	lb.	.06 @	.06½
Zinc oxide:			
American Horse Head			
Special	lb.	.07½ @	.08
XX red	lb.	.07 @	.07½

Colors

WHITE—*Continued*

French process, Florence White seal	lb.	$0.11	@$0.11¼
Green seal	lb.	.09¾	@ .10¼
Red Seal	lb.	.08¾	@ .09¼
Azo (factory): ZZZ (lead free)	lb.	.07	@ .07½
ZZ (—5% leaded)	lb.	.06¼	@ .06¾
Zinc sulphide	lb.	.45	@

YELLOW

Arsenic, yellow	lb.	.85	@ 1.00
Cadmium, sulphide, light	lb.	1.85	@
Chrome, light and med.	lb.	.16	@
Dipped goods	lb.	1.00	@
India rubber	lb.	1.00	@
Ochre, domestic	lb.	.03¼	@ .03½
imported	lb.	.03½	@ .03¾
Gritless yellow	lb.	3.50	@

Compounding Ingredients

Aluminum flake (carloads)	ton	25.00	@29.45
hydrate, light	lb.	.17	@ .18
Ammonia carbonate	lb.	.06¼	@ .08¾
Asbestine	ton	20.00	@25.00
Aluminum silicate	ton	22.00	@25.00
Barium, carbonate, precip.	ton	65.00	@70.00
dust	ton	100.00	@
Barytes, pure white C. L.	ton	23.90	@
off color (carloads)	ton	20.00	@
uniform floated (carloads)	ton	23.90	@
Basofor	lb.	.04¼	@
Blanc fixe	lb.	.04¼	@ .04½
Carrara filler (factory)	lb.	.01½	@
Chalk, precip. extra light	lb.		@
heavy (f.o.b. factory)	lb.		@
China, clay, Dixie	ton	22.00	@32.00
Blue ribbon	ton	15.00	@
Blue Ridge	ton	22.00	@32.00
Cotton linters clean mill-run	lb.	.04½	@
Fossil flour (powdered)	ton	60.00	@
(bolted)	ton	60.00	@
Glue, high grade	lb.	.30	@ .40
medium	lb.	.20	@ .26
low grade	lb.	.15	@ .18
Graphite, flake	lb.	.05	@
amorphous	lb.	.05	@
Infusorial earth (powd.)	ton	60.00	@
(bolted)	ton	65.00	@
Liquid rubber	lb.	.15	@
Mica, powdered	lb.	.15	@
Pumice stone, powdered	lb.	.03	@ .05
Rotten st., powd. (bbls.)	lb.	.02½	@ .04½
Silica, gold bond	ton	35.00	@
silver bond	ton	25.00	@
Soap bark, cut	lb.	.08½	@ .10
Soapstone, powdered, gray	ton	12.00	@
Starch, powd. corn (bags)	cwt.	2.57	@ 2.67
(bbls.)	cwt.	2.85	@ 2.95
Talc, soapstone	ton	18.00	@25.00
Terra blanche	ton	25.00	@28.00
Tripoli flour, cream or rose	ton	25.00	@27.50
white (factory)	ton	27.50	@30.00

Chemical Market—*Continued*

New York Quotations

September 25, 1922

Prices subject to new tariff revision

Tyre-lith	ton	$85.00	@$90.00
Whiting, Alba	cwt.		@
chalk	ton	25.00	@30.00
commercial	cwt.	1.00	@ 1.10
Danish	ton	20.00	@
English cliffstone	cwt.	1.60	@ 1.75
gilders (bolted)	cwt.	1.15	@ 1.25
K. T.	ton	14.00	@
Paris, white, American	cwt.	1.25	@ 1.35
Perfection	ton	22.00	@25.00
Plymouth	ton	16.00	@18.00
Quaker	ton	13.00	@15.00
Superfine	ton	13.00	@
Wood pulp, XXX	ton	30.00	@
X (f.o.b. factory)	ton	25.00	@

Mineral Rubber

Gilsonite	ton	65.00	@
Genasco (factory)	ton	60.00	@62.00
Hard hydrocarbon	ton	32.00	@42.00
Soft hydrocarbon	ton	30.00	@35.00
320/340 M. P. hydrocarbon	ton		@
300/310 M. P. hydrocarbon	ton		@
Pioneer, M. R., solid (fac.)	ton	42.00	@44.00
M. R. granular	ton	52.00	@54.00
Robertson, M. R., solid	ton	35.00	@75.00
M. R. granular (factory)	ton	54.50	@72.50
Rubrax (factory)	ton	60.00	@
States "A"	ton		@
No. 1	ton		@
Synpro, gran. M. R. (fac.)	ton	55.00	@65.00

Oils

Avoilas compound	lb.	.14	@ .15
Castor, No. 1, U. S. P.	lb.	.13	@
No. 3, U. S. P.	lb.	.12½	@
Corn	lb.	.11	@
Cotton	lb.	.10	@
Glycerine	lb.	.17	@ .17½
Halowax (500-lb. drums)	lb.	.25	@ .27
Linseed, raw	gal.	.88	@ .90
Palm lagos	lb	.06	@ .07
Palm, niger	lb.	.05	@ .06
Peanut	lb.	.11	@
Petrolatum, standard	lb.	.05	@ .08
Petrolatum, sticky	lb.	.08	@ .10
Pine, steam distilled	gal.	.80	@ .85
Rapeseed, refined	gal.	.83	@
blown	gal.	.90	@ .95
Rosin	gal.	.40	@ .48
Synpro	gal.	.40	@ .80
Soya bean	lb.	.11½	@
Tar	gal.	.26	@

Resins and Pitches

Cumar resin hard	lb.	$0.09	@$0.15
soft	lb.	.09	@ .15
Tar, retort	bbl.	10.00	@11.00
kiln	bbl.	10.00	@
Pitch, Burgundy	lb.	.04½	@
coal tar	lb.	.01¼	@
hardwood	ton	60.00	@
pine tar	lb.	.03	@
ponto	lb.	.07½	@
Rosin, K (bbl.)	280 lbs.	6.90	@
strained (bbls.)	280 lbs.	6.90	@
Shellac, fine orange	lb.	.90	@

Solvents

Acetone (98.99% drums [6.62 lbs. per gal.])	lb.	.17½	@
Benzol (90%, drums [7.21 lbs. per gal.])	gal.	.27	@ .32
pure (drums)	gal.	.30	@ .35
Carbon bisulphide (dms. [10.81 lbs. per gal.])	lb.	.06½	@ .07
tetrachloride (drums. [13.28 lbs. per gal.])	lb.	.09	@ .11
Motor gasoline (steel bbls.)	gal.	.25	@
Naphtha, V. M. & P.	gal.	.24	@
solvent (drums extra)	gal.	.23	@
Paracymene (factory)	lb.	.15	@
Toluol, pure (7.21 lbs. per gal.)	gal.		@
Turpentine, spirits	gal.	1.33	@
wood, steam distilled	gal.	1.25	@

Substitutes

Black	lb.	.08	@ .14
Brown	lb.	.10	@ .15
White	lb.	.09	@ .16
Brown factice	lb.	.07	@ .15
White factice	lb.	.07½	@ .15

Vulcanizing Ingredients

Black hypo	lb.	.25	@ .30
Sulphur chloride (drums)	lb.	.08	@
(jugs)	lb.	.13½	@
Sulphur, Bergenport brand, 100% pure (bbls.)	cwt.	2.55	@ 2.90
(bags)	cwt.	2.30	@ 2.65
Sulphur flour (bbls.)	cwt.	2.60	@ 3.15
(bags)	cwt.	2.35	@ 2.90
Superfine 100% pure	cwt	2.60	@ 3.15

(See also Colors—Antimony)

Waxes

Wax, beeswax, white, com.	lb.	.45	@
ceresine, white	lb.	.12	@
carnauba	lb.	.20	@
montan	lb.	.03¾	@ .04
ozokerite, black	lb.	.18	@
green	lb.	.26	@ .27
paraffine	lb.	.02¾	@ .06½
sweet wax	lb.	.12	@

*Nominal.

Government Asks Return of German Patents

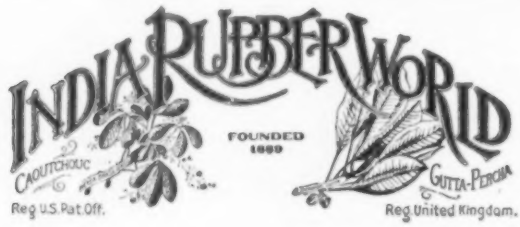
Rubber manufacturers throughout the United States may get their crude material free of duty, but a great many substances used in the compounding of rubber are subject to a heavy tariff for revenue and protection. The prospect for a sharp increase in such tariff has given the manufacturers no small concern, for, compelled as they are to compete with foreign goods, absurdly underpriced, they find it no easy matter in most cases to do what other more fortunate manufacturers are able to do, pass the charge on to that patient mortal, the ultimate consumer. Now the rubber men have something else besides congressional tariff debates to interest them. The Department of Justice has recently filed a suit in equity against the Chemical Foundation, Inc., for the return to the Federal Government of all the patents, trade marks, etc., heretofore sold to the Chemical Foundation by the former Alien Property Custodian, Francis P. Garvan, now president of the Foundation.

Arrayed in opposition to the executive order are such representative bodies as the American Chemical Society and the Synthetic Organic Chemical Manufacturers' Association of the United States, which claim that the contemplated action would deal the newly-developing organic chemical industry a deadly blow and imperil the investment of $100,000,000 of American capital. Were it to come to pass, they contend, the United States would be left once more at the mercy of Teutonic manufacturers of medicinals, dyestuffs, and other chemicals. It is further claimed that no American manufacturer may gain a monopoly, as all citizens are entitled to a license to make any of the chemicals referred to in the patents, trade marks, etc.

The administration forces content themselves for the time being with the claim that the Foundation had acquired unwarranted rights, and with the denial of a charge that German interests have been given special consideration. When the Government's suit is pressed, the real reasons for the action will doubtless be fully revealed.

As consumers of large quantities of coal tar derivatives, used chiefly as accelerators and to a much less degree as coloring matter, the rubber manufacturers are quite anxious to know whether or not they will have to buy such chemicals from home or foreign manufacturers, and whether or not they will have to pay more or less. But if it is a question as to whether or not a deserving home industry is to be sustained, they can be depended upon to do their part to sustain such industry against any foreign influence.

REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients."



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